Here's where has to "TAKE IT"

"Edgemark of Quality"

The banging of cars being coupled, the sudd starting and stopping of shifters and long freights, put a hea strain on track fastenings. But yard tracks can "take it" when j bolts have Reliance Hy-Pressure Hy-Crome Spring Washers to h maintain their tightness.

Informed maintenance men have proved, in the y as well as on main line track, Reliance Hy-Pressure Hy-Cr Spring Washers play an important part in cutting maintena costs and keeping track joint bolts *tighter longer*.

Made from special-analysis steel, providing maxim spring power and fatigue resistance, Reliance Hy-Pressure H Crome Spring Washers possess reactive value which automatic compensates for looseness resulting from wear.

An interesting illustrated folder of Reliance H Crome Spring Washers for track-work offers pe nent pointers on maintenance-of-way econo Write for a copy.

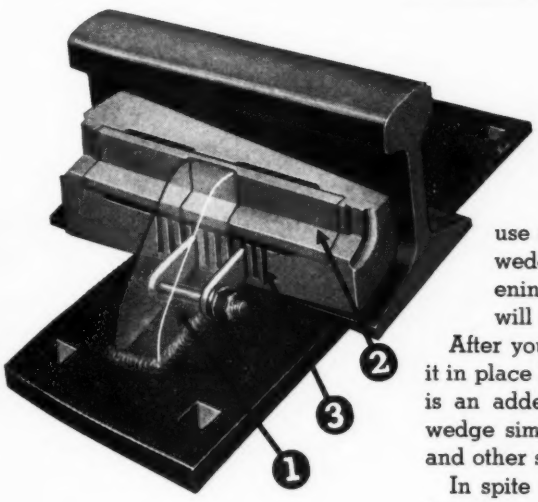
EATON

EATON MANUFACTURING COMPANY

Reliance Division

Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montr

A BRACE THAT *Cannot Loosen* UNDER SHOCK



Bethlehem's 811 Rail Brace, when installed, is so tightly wedged that even the most severe jolts cannot loosen it. It's made to counteract the heavy thrust so common in modern high-speed traffic.

The 811 is built around a unique principle that makes use of wedging action. Note the illustration; see how the steel wedge is driven between the brace (1) and the rail. The tightening effect is increased by an integral steel spring (2), which will withstand a compression force of at least 20,000 lb.

After you've driven in the wedge until a rigid fit results, you lock it in place by turning down twin integral pawls into the slots (3). This is an added safeguard that double-protects against loosening. The wedge simply cannot back up or be squeezed out by heavy thrust and other shocks.

In spite of its positive action, Bethlehem's 811 is an easy brace to install or remove. No special tools are required; it's placed or dismantled in a jiffy. Ask a Bethlehem man to show you some installations. There are probably many near you.

★ BETHLEHEM STEEL ★

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Mount Morris, Ill., post office. Address communications to 79 W. Monroe St., Chicago 3, Ill.

BEAT THE 40 HOUR WEEK
With the JACKSON
—and get a better job at lower cost!

MULTIPLE MT TAMPER

REQUIRES JUST 1 OPERATOR INSTEAD OF 12
• • • • • Obviously a huge labor saving.

IT'S FAST — 3 to 5 ties per minute.

PRODUCES PERFECT TRACK IN ONE OPERATION
• • • • in any ballast — no follow-up required.

WORKS WELL IN TANDEM — usually doubling footage without
• • appreciably increasing gang ahead of machines.

THOROUGHLY PRACTICAL ON "HOT" TRACK.
(Average traffic conditions)

Write wire or phone for further information or location of nearest JACKSON "MT" in operation — or call in a Jackson consulting engineer, a practical maintenance man who is thoroughly capable of analyzing your particular conditions and demonstrating what you can accomplish with the "MT".

Prompt deliveries for those who wish to capitalize on the tremendous advantages of this machine immediately.

ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Michigan

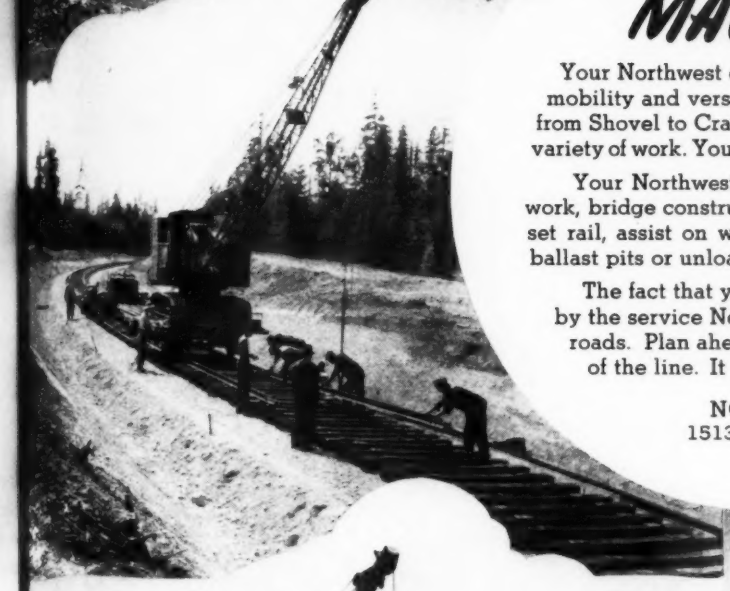
A RAILROAD MAN'S MACHINE

Your Northwest does things no track type machine can do. Its mobility and versatility made possible by its easy convertibility from Shovel to Crane or Dragline, permits scheduling it on a wide variety of work. You'll complete jobs you couldn't get finished before.

Your Northwest will handle bank trimming, ditching, magnet work, bridge construction, pile driving and storeyard work. It will set rail, assist on wrecking work, dig lead-off ditch, work in the ballast pits or unload and load material.

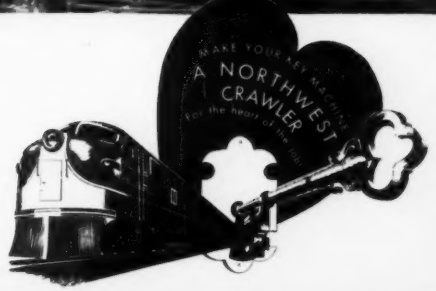
The fact that your Northwest is a railroad man's rig is proved by the service Northwests are giving many leading Class I Railroads. Plan ahead now to have a Northwest on every section of the line. It means better operation at lower cost.

NORTHWEST ENGINEERING COMPANY
1513 Field Bldg., 135 South LaSalle St., Chicago 3, Ill.



NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

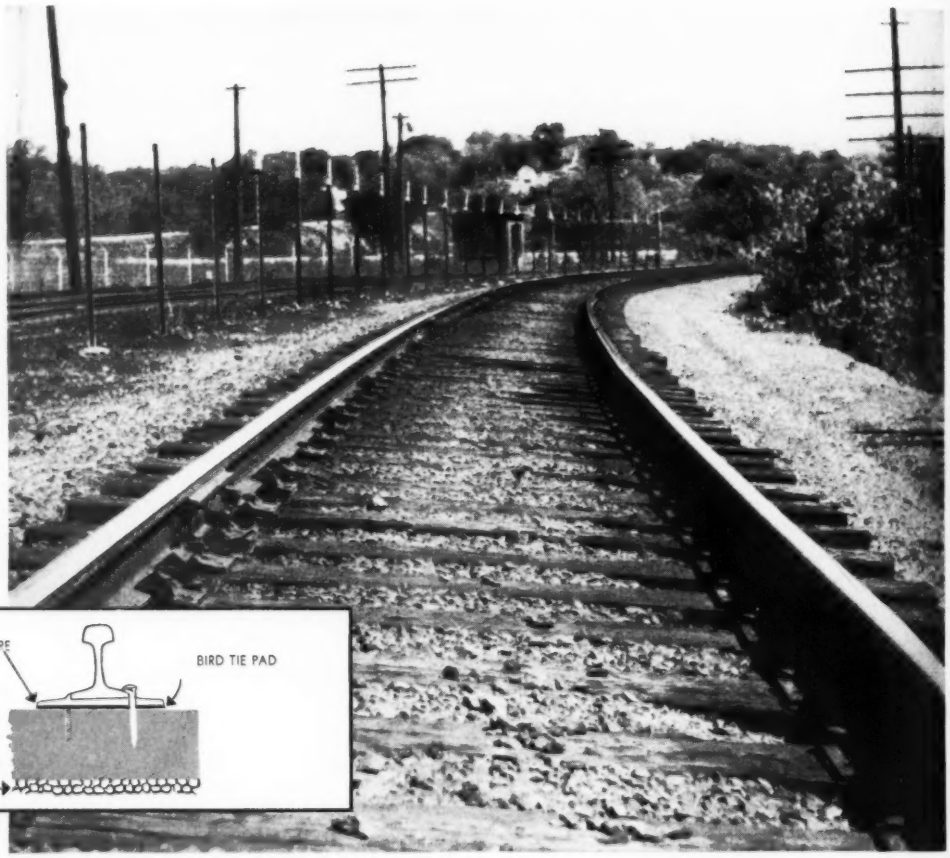


CUT LABOR COSTS

for gauge, line and surface with Bird Tie Pads

Since the installation of Bird Tie Pads on this tough 6°30′ curve in 1946, the section foreman reports gauge, line, and surface are holding for the first time in history, and requiring only a minimum of maintenance work.

Before the installation of Bird Tie Pads it had always required work on gauge, line, or surface every few weeks. Also, the ballast is staying in the cribs instead of fanning out from the low side.



● Other things being equal, Bird Tie Pads help considerably in holding gauge. The preservation of dry, sound, spike hole wood and elimination of uneven plate cutting clearly remove two causes of gauge loss. Cushioning of lateral impacts may also be a factor in preventing loss of spike position.

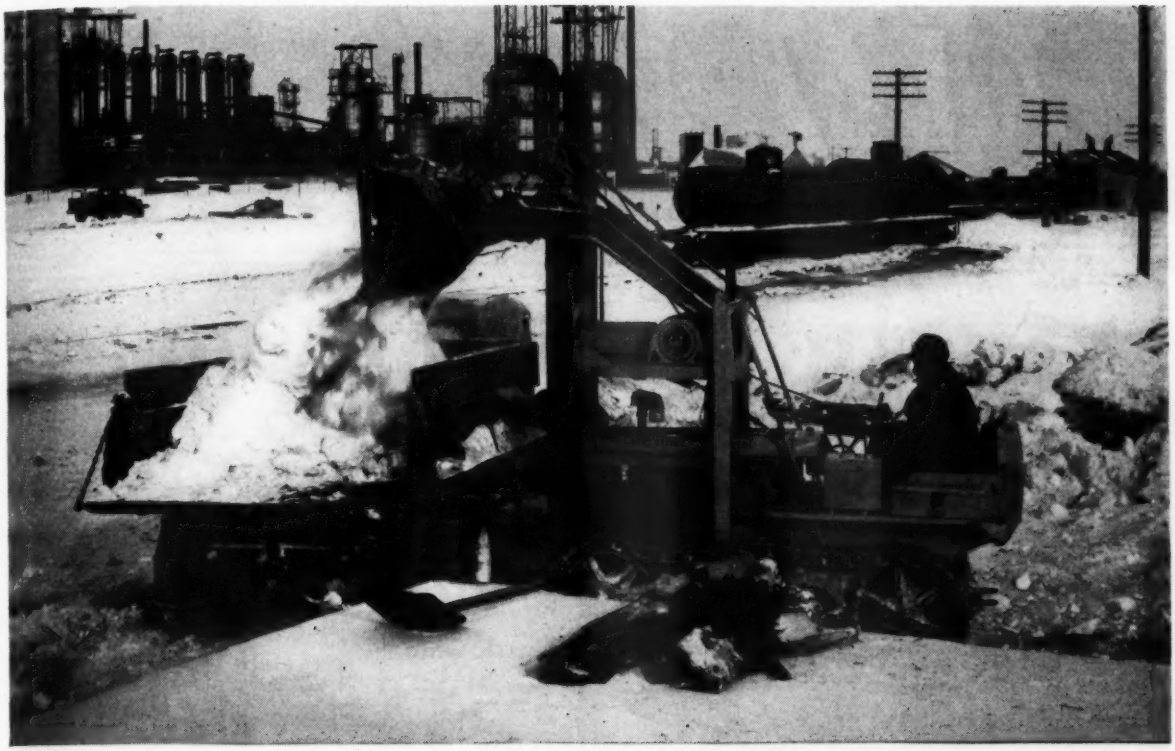
As our larger tie pad installations of more recent years . . . several miles and more in length, and in varied locations . . . have built up enough time in track to show what they will do, reports are coming in that they produce a major improvement in holding line and surface and give a noticeably better ride. The pads apparently cushion impacts and damp vibration sufficiently so that ties displace or disintegrate their supporting ballast less quickly than they otherwise would.

We do not yet know just how large savings will be... but here are a few clues: with lining and surfacing costs running over $400 per mile per year, and track supervisors estimating labor savings as high as 40%, the amount of savings will be substantial. Savings on gauge, line, and surface are in addition to savings from tie life extension and the use of smaller plates. Tie life extension alone not only covers cost of the tie pad, but also gives an additional net saving in the order of 20% of the tie costs . . . more on expensive bridge and switch ties and in fast wearing locations such as sharp curvature. For further details, write us today . . . Bird & Son, inc., 38 Birch St., East Walpole, Mass.

BIRD TIE PADS

East Walpole BIRD & SON inc. *Massachusetts*

For additional information, use postcard, pages 835-836



The blizzard of '49. A "Caterpillar" D2 Tractor with Traxcavator removing snow at 41 below zero on the N.P. Railroad in Sinclair, Wyo. A ¾ cu. yd. bucket is backed by 32 drawbar hp.

A D4 Tractor and Traxcavator filling a roadbed on a spur of the Minneapolis, Northfield & Southern Railway.

On the ball

. . . Winter, Spring, Summer and Fall!

THESE "Caterpillar" Diesel Tractors equipped with Trackson Traxcavators don't know the meaning of "vacation." They're so versatile, they're kept busy all year round. In the winter, on snow removal in yards, stations and critical points on the line. The rest of the year, on dozens of 'dozing, building and loading jobs.

Best of all, these huskies don't need a vacation. They're sturdily built to give years of dependable, economical performance with a minimum of down time. And the well-equipped "Caterpillar" dealer near you is always available for fast, efficient service. Get the complete picture of these money-saving workers from him.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR

REG. U. S. PAT. OFF.

WHEN YOU THINK OF MAINTENANCE, THINK OF THE BIG YELLOW MACHINES THAT ARE ON THE JOB YEAR ROUND.

DIESEL ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

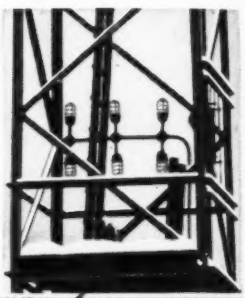
RAILROADERS'

3½¢ AN HOUR FOR POWER KEEPS SWITCHES SNOW-FREE

General Electric Calrod Snow Melters conquer snow easily, economically in B&O yards at Willard, Ohio.

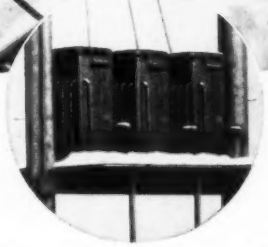
Yes, that's all it cost last winter to operate each of the G-E Calrod heaters that kept 112 switch points clear of snow and ice in the B&O classification yards at Willard, Ohio. These snow melters—part of a 2-million dollar yard modernization program that also included car retarders, power-operated switches, and floodlighting with photo electric control—played a major role in enabling the Willard yards to classify 2,300 cars per day smoothly and efficiently throughout the winter. 38,062 kwh were used at a total cost of $608.99—or an average of 3½ cents per switch point per hour of storm!

If you, too, want to combat snow the easy, electrical way, then get ready for next winter's storms by installing G-E Snow Melters *now!* We'll be glad to help you make a survey for a complete system that meets your needs. For detailed information on G-E Calrod Snow Melters check Bulletin GEA-2719. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



A glance at these indicator lamps tells the control tower operator whether the snow melter circuits are off, on low heat, or on high heat. Snow melters are easily adapted to automatic control, and do not interfere with the track circuits of signals.

G-E Snow Melters are easy and inexpensive to install, require practically no maintenance. They generate and dissipate heat right at the movable point.



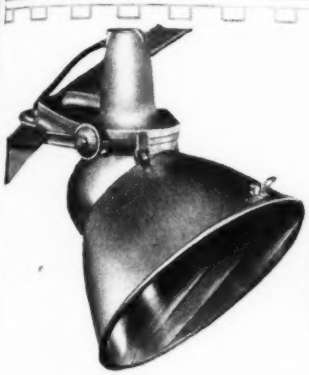
Three of the power distribution transformers used by the B&O. These transformers are rated 100 kva, 7200/12470—240/460. Together with another bank of three 200 kva transformers, they provide plenty of capacity for the 850 kw connected snow melter load.

You can put your confidence in—

GENERAL ELECTRIC

DIGEST

News and notes about
GENERAL ELECTRIC products
for the railroad industry



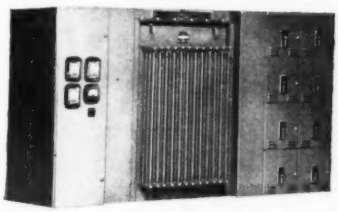
GOOD LIGHTING

speeds after-dark traffic

Darkness needn't mean a slowdown of operations in your yards if you have General Electric's type L-69 floodlights on the job. They put plenty of light right where you need it, eliminate blinding glare and deep shadow—the two most common causes of inefficient night operations. Good yard lighting also makes it easier for retarder operators to see switches, cars, and trackage—helps them judge speed and distance accurately. The L-69 floodlights give you high-efficiency lighting—and at the same time, lower initial, replacement, and maintenance costs. Write for further information.

UNIT SUBSTATIONS

Complete, **Ready to Install**



General Electric unit substations, in ratings from 2300 volts to 15,000 volts/600 volts and lower, come complete —shipped in two or three sections that are ready to bolt together and connect to power cables. These completely metal-enclosed substations supply power for snow melting, lighting, signaling, and shop purposes. They can be located almost anywhere—indoors or outdoors, often in space that is otherwise not being used. Because these small substations can be located close to the point of power utilization without expensive fireproof vaults, they usually enable you to cut the cost of your electric power system. They mean simplified purchasing—only one purchase transaction is required—and faster, easier installation. For more data check off Bulletin GEA-3592 in the coupon.

The BULLETIN BOARD

Write for your copies NOW!

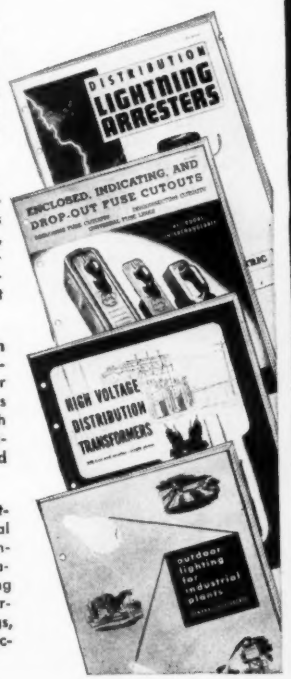
Four new bulletins that will help you maintain and operate lightning and power equipment easier, at lower cost.

Bulletin GEA-2975D, "Distribution Lightning Arresters." Covers the major points in the protection of distribution systems and describes the features, construction, and characteristics of pellet type lightning arresters.

Bulletin GEA-3448C, "Enclosed, Indicating, and Drop-Out Fuse Cutouts." Describes the applications, features, and specifications of fuse cutouts. Explains how these cutouts solve *all* primary cutout problems.

Bulletin GEA-4521, "High Voltage Distribution Transformers." 500-kva and smaller single-phase transformers that provide unusually high insulation strength and ability to withstand repeated impulse stresses.

Bulletin GEA-3640B, "Outdoor Lighting for Industrial Plants." A new bulletin containing up-to-date information on lighting for loading platforms, work areas, storage areas, roadways, sidings, buildings, fence and protective lighting.



General Electric Company, Section E152-3
Apparatus Department, Schenectady 5, N. Y.

Please send me the following bulletins:

( ) **GEA-2719—Calrod Snow Melters**
( ) **GEA-3592—Unit Substations**
( ) **GEA-3448—Enclosed, Indicating, and Drop-Out Fuse Cutouts**
( ) **GEA-2975—Distribution Lightning Arresters**
( ) **GEA-4521—High Voltage Distribution Transformers**
( ) **GEA-3640—Outdoor Lighting for Industrial Plants**

Name.....

Company.....

Street.....

City..... **State**.....

For additional information, use postcard, pages 835-836

Take a Tip From the FRISCO on *SAVINGS* with LORAINS

A FEW OF THE *Many* WAYS LORAIN CAN SERVE AND SAVE

Team track and terminal material handling
Bridge construction
Ditch digging and cleaning
Pile driving, pole setting
Material stockpiling
Scrap handling
Yard and road service for storekeepers
Heavy lifts
Slide removal
Emergency fueling and wrecking service
On-the-track or off-the-track service, on-the-car or off-the-car service

"Lorains on The Railroads"

Send for this free folder showing Lorain's service record with the railroads—how you can save with Lorain!

Here's streamlined railroading at the Springfield, Missouri reclamation plant of the St. Louis-San Francisco Railway Co. A Lorain "TL" crane with a magnet, handles scrap and company supplies. As many as 200 tons per 8 hour day get a lift with this Lorain.

And here's a lesson in economy with Lorains. *One man* at the controls works all sections of the yard—a Lorain can travel anywhere—on crawler or rubber-tire mountings. "Crane-handling" with Lorains costs but a fraction compared to "man-handling." Five Lorains for the "Frisco" are proof of cost-cutting, time-saving performance.

Take a tip from the "Frisco"...and scores of other modern railroads. See your nearby Thew-Lorain Distributor for the story of Lorains on the railroad. There are sizes, mountings and front ends to exactly fit your needs!

THE THEW SHOVEL CO.
LORAIN, OHIO

THEW Lorain®

OVER 75 LORAIN COMBINATIONS

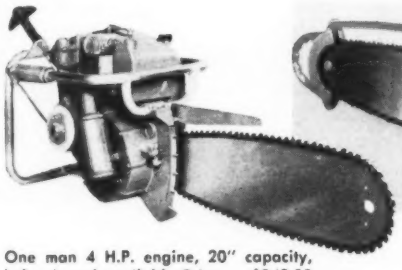
3 series of models in a wide range of capacities; with 5 interchangeable booms; available on crawler or on rubber tires as engine self-propelled or 2-engine Moto-Crane mountings.

Shovels · Cranes · Draglines · Clamshells · Hoes

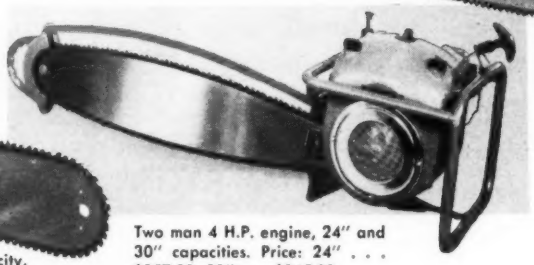
REED-PRENTICE TIMBERHOG CHAIN SAWS

GAS ENGINE UNITS

Two man 4 H.P. engine, 36" capacity. Price . . . $375.00



One man 4 H.P. engine, 20" capacity, helper's end available. Price . . . $349.00



Two man 4 H.P. engine, 24" and 30" capacities. Price: 24" . . . $357.00; 30" . . . $365.00

ELECTRIC DRIVEN UNITS

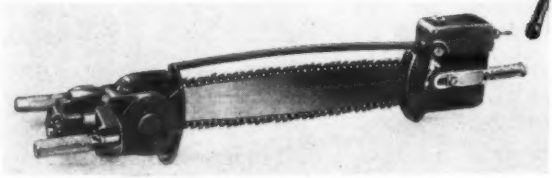
Two man 5 H.P. electric drive, 24", 36", 48" and 60 " capacities. Price . . . 24" $560.00; 36" $625.00; 48" $660.00; 60" $685.00

Two man 3 H.P. electric drive, 24" and 36" capacities. Price: 24" . . . $504.00; 36" . . . $540.00

Two man 1½ H.P. electric drive, 24" capacity. Price . . . $385.00

PNEUMATIC DRIVEN UNITS

Two man 5 H.P. pneumatic drive, 24" and 36" capacities. Price . . . 24" $548.00; 36" $583.00



Two man 3½ H.P. pneumatic drive, 24" capacity. Price . . . $345.00

The Original Manufacturer of Portable Power Chain Saws

You'll find a TIMBERHOG chain saw for every wood-cutting purpose. Send coupon today for descriptive circular and complete information.

NEW YORK 6
75 West Street

"TIMBERHOG"
REED-PRENTICE CORP.
WORCESTER MASS., U.S.A.
SAWS

CLEVELAND 13
1213 W. 3rd Street

LOS ANGELES 11
2314 Santa Fe Ave.

CLIP AND MAIL COUPON NOW

Reed-Prentice Corp.
Dept. R
Worcester, Mass.

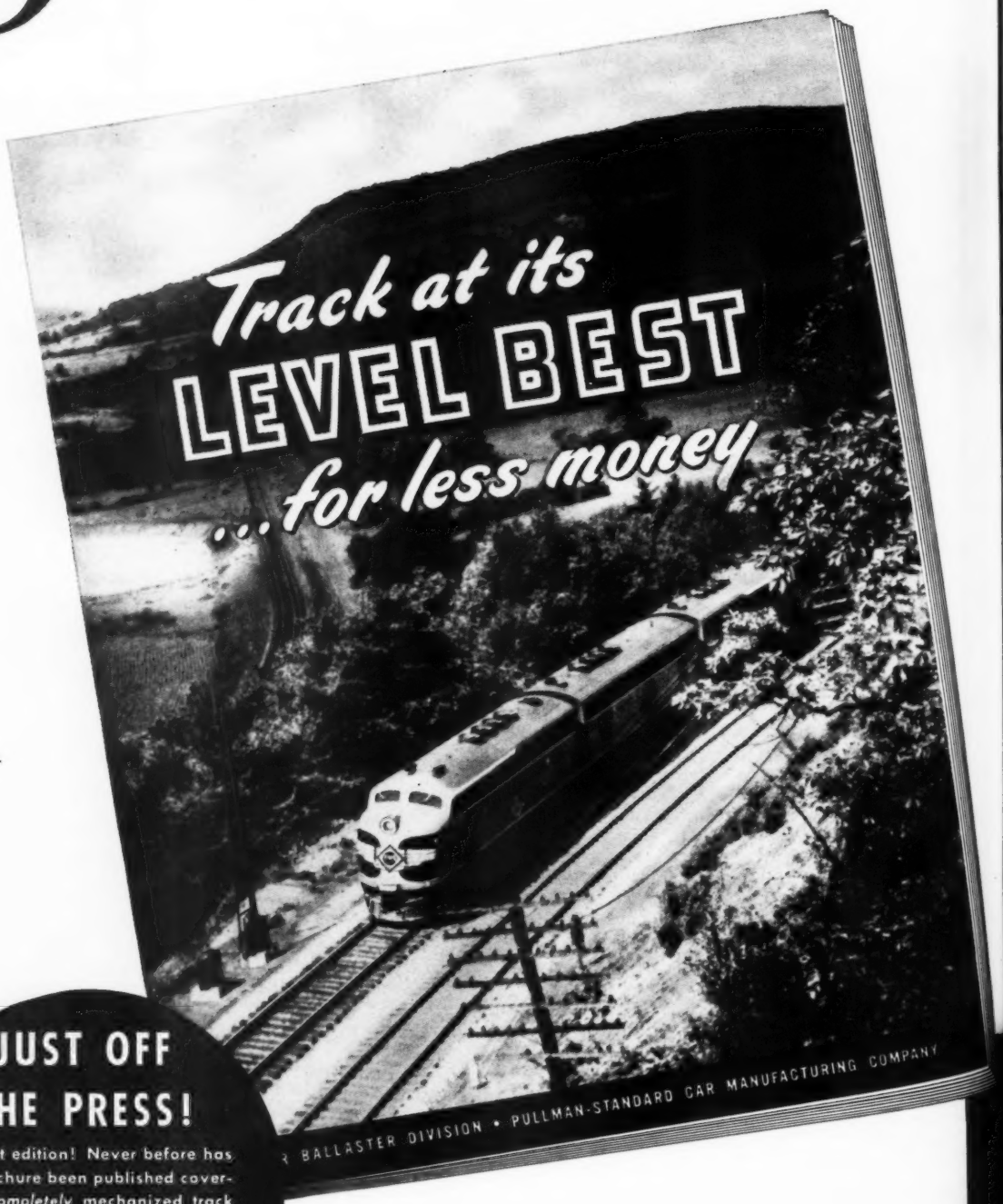
Please send folder and details on the complete TIMBERHOG Portable Chain Saw line.

NAME .....

ADDRESS .....

For additional information, use postcard, pages 835-836

Book-of-the-Year



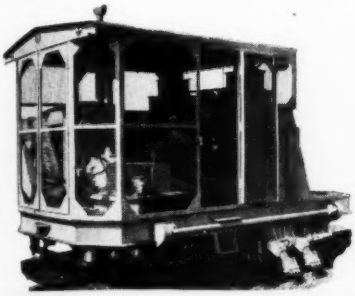
JUST OFF THE PRESS!

A first edition! Never before has a brochure been published covering *completely* mechanized track maintenance.

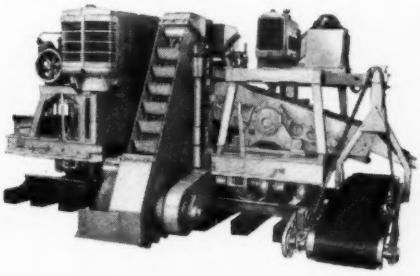
MAIL THE COUPON ...TODAY!

for Railroad Men!

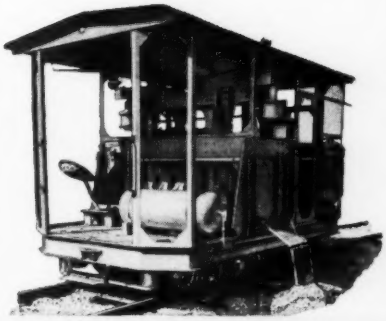
THE FACTUAL STORY OF THE...



POWER BALLASTER (Tamper)



POWER BALLAST CLEANER



POWER TRACK CRIBBER

How Your Railroad can save Thousands of Dollars in Track Maintenance costs!

How <u>One</u> <u>Machine</u> can tamp 450 to 500 Track Feet Per <u>Hour</u>!

Case Histories! Facts! Figures!

REQUIRED READING! That is what many railroad men who are facing the problems of the new 5-day week are saying about Pullman-Standard's new brochure. It tells the story of the application of a proved machine mass-production system to track maintenance work . . . for the first time in the history of railroading!

This booklet contains dozens of helpful photographs, detail drawings, and interesting descriptions. It shows you exactly how the Pullman-Standard Power Track Cribber, Ballast Cleaner, and Power Ballaster operate; how a few men can do the work of many, and do it better as well as cheaper.

This 24-page brochure contains actual facts and figures to illustrate how a steadily growing number of railroads are realizing savings of $600, $800, even $1,000 per mile, in each of these maintenance operations.

You will want your own copy of "Track at Its Level Best . . . for Less Money." Ask for it today.

Pullman-Standard

CAR MANUFACTURING COMPANY

POWER BALLASTER DIVISION

79 East Adams Street, Chicago 3, Illinois

BIRMINGHAM 3, 1004 First National Building
CLEVELAND 15, 907 Midland Building
NEW YORK 17, 52 Vanderbilt Avenue
PITTSBURGH 19, 1115 Gulf Building
SAN FRANCISCO 4, 2910 Russ Building
WASHINGTON 6, D. C., 1025 Connecticut Avenue, N. W.

Pullman-Standard Car Manufacturing Co.
Power Ballaster Division
79 East Adams St., Chicago 3, Illinois

Please send me a personal copy of your new brochure, "Track at Its Level Best . . . for Less Money."

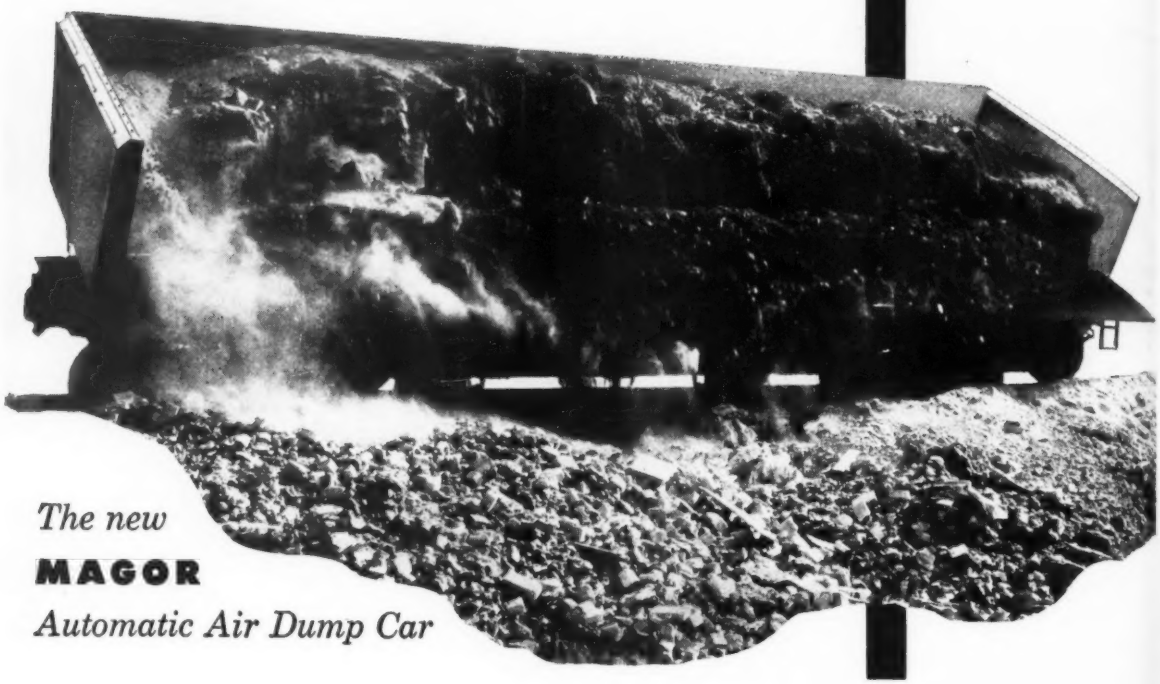
Name.....

Company.....*Title*.....

Address.....

City.....*Zone*....*State*.....

IT PAYS FOR ITSELF!



The new
MAGOR
Automatic Air Dump Car

● When you add up the savings effected by Magor Automatic Air Dump Cars for maintenance of way work, you'll find that Magor cars pay for themselves in a few short years.

Here's how it figures—

Train crew, foreman, labor gang and work train equipment run the cost of the average work train up to about $200 a day. But, in any eight hour day, you're lucky if you get six or seven hours on the job. And out of those short hours time is spent waiting for the crane to unload gondolas. But, it takes one man less than a minute to dump a fully loaded Magor Automatic Air Dump Car—an important factor in busy territory.

Figure you save one hour a day—twice a week in this service. That's over a hundred hours a year. Figured on the basis of $200 a day, that's a savings of $2600.

Naturally, you're going to use your Magor Air Dump Cars for more than we've figured. Especially after you learn how handy they are for numerous jobs that you've been doing in the old expensive way—ditching, cut widening and shoulder fill; rip rap and washout service; locomotive ash pit and terminal waste disposal; tie and rail hauling; snow removal; and construction work involving sand, gravel and other materials.

Maintenance savings add up too. Magor Cars are rugged and dependable. They'll operate efficiently on the toughest jobs.

Look into this equipment that pays for itself.

Ask for our free bulletin D-100 for further information showing how you can save your Company important maintenance dollars.

MAGOR CAR CORPORATION, 50 CHURCH ST., NEW YORK 7, N. Y.
World's Largest Producer of Air Dump Cars

Let Allis-Chalmers Off-Track Equipment Help You

Meet the Challenge

Rugged Allis-Chalmers Diesel Tractors and Motor Graders do more work in fewer hours — put in as much as 50 percent more working time than rail-bound equipment. They are quickly transported from job to job by flat car, trailer or under their own power — go into action immediately — get the job done in a hurry.

A-C Equipment Helps You Modernize Construction and Maintenance Methods— Brings Substantial Savings in Time and Money

Building and Maintaining Access Roads—sloping, backfilling, widening shoulders, cutting out and reshaping ballast, removing snow, scarifying — these are some of the jobs handled effectively by A-C motor graders. Four heavy-duty diesel models, 50.4 to 104 brake hp., 17,772 to 22,140 lb. Also, the new low-cost gasoline-powered Model D for lighter work.

Handling Ballast or Other Material is easy with the Allis-Chalmers HD-5G and Tracto-Shovel. This outfit can dig, carry, dump and spread — is ideal for all-around work. Various interchangeable attachments widen usefulness — heavy-duty bulldozer blades, V-type snow plow and special sizes and types of bucket and bucket teeth.

Stockpiling and Reclaiming Coal is simplified with A-C tractors. Storage piles can be placed wherever there is available space — without expense for conveyors, tracks, etc. Hauling and compacting with tractor-scraper units or bulldozers cuts down heat loss and danger of fire. Self-loading scrapers facilitate reclaiming coal.

Mowing, Hauling, Sweeping are jobs for which the Model IB Wheel Tractor is ideally suited. Compact enough to get into tight places, powerful enough for any job. Electric lights and starting. With mower it handles slopes 85° above to 40° below horizontal. Rugged 5- or 6-ft. cutter bar is hydraulically raised and lowered.

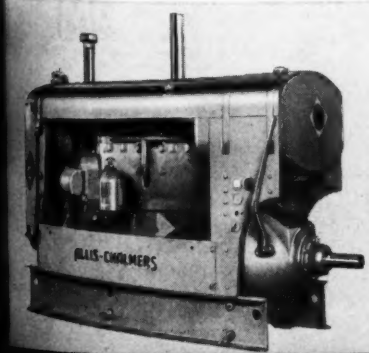
of the 40-hour Week

Construction and Maintenance — Allis-Chalmers 2-cycle Diesel Tractors work with bulldozers, scrapers, other auxiliary equipment on all types of grading and maintenance. Right size for every job — from 11,000-lb. HD-5 to world's largest 40,000-lb. HD-19, with exclusive torque converter drive.

Clearing Derailments, Repairing Washouts or Washins, A-C diesel tractors can put tracks back in service in a fraction of the time required by rail-bound equipment. Go to work anywhere along track — not just at ends of tie-up. If necessary, they build a shoofly around paralyzed section in record time.

Laying Rails goes faster, easier with this HD-5. Equipped with a side-boom, it replaces costly draglines and cranes for this type of work. Angledozer on tractor broadens its field of usefulness.

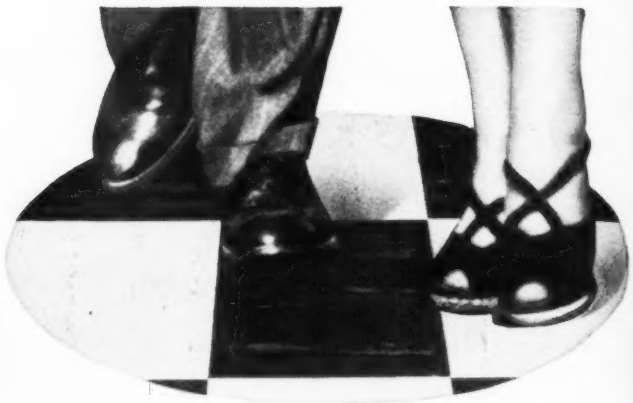
Any Power Requirement—A-C Power Units are high in torque, provide heavy-duty power for any service, steady or intermittent. Mass produced for lowest cost, along with engines by the thousands for tough tractor service. Nation-wide service. Choice of fuels. Five models, open or enclosed, 15 to 110 hp.



Write for complete information on modern, proved Allis-Chalmers off-track work equipment, or let us put you in touch with your Railroad dealer.

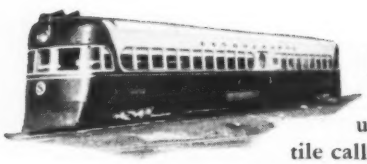
ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

TROD ON BY 400,000 PASSENGERS...



Close-up of new Terraflex floor tile used in streamlined passenger motor car of New York, Susquehanna and Western Railroad shows little scuffing or wear after approximately 16,000 passengers a month used it for 26 months.

Terraflex, the new J-M plastic asbestos floor tile won't give up!



Here is the ideal decorative flooring for all railroad use! It is a plastic asbestos tile called TERRAFLEX—an entirely new type floor covering pioneered and developed by Johns-Manville.

Installed in the car above, Terraflex shows no signs of giving up after 26 months of service. During this time, some 400,000 people trod this car's aisles—based on counts from passenger train performance reports of the railroad.

The reason Terraflex stands up in such service is found in its remarkable characteristics. It is unusually resilient and soft under foot. It resists fire, cigarette burns, scratches. It is unaffected by greases, oil, alkalis, and mild acids. Laboratory and wear tests have shown that it has two to three times the abrasion resistance of standard asphalt tile.

The colors of this new J-M flooring are clearer, brighter and more stable than ever before obtained in a resilient flooring. Its many remarkable qualities will bring new life and beauty to your station and office floors . . . help you pare down flooring maintenance costs for years to come. For further information write Johns-Manville, Box 290, New York 16, New York.

Johns-Manville

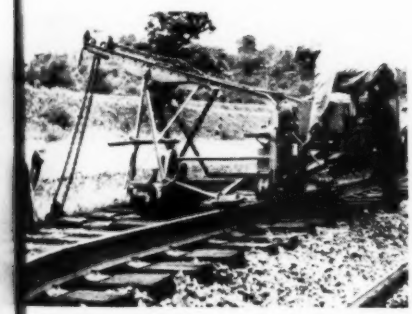
91 YEARS OF SERVICE TO TRANSPORTATION

IMPROVED

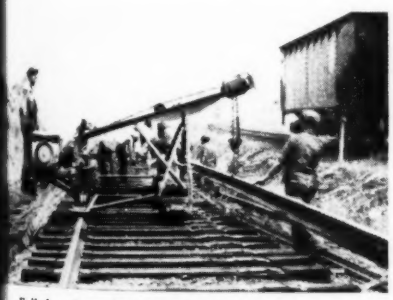
LAYS THE HEAVIEST RAIL IN LESS THAN A MINUTE

Machine has been hauled to rail-laying location with auxiliary wheel engaged.

TYPE C MECO RAIL LAYER



Operator is applying Rail Grip to running rail. Tong man is attaching tongs to chalk-marked center of new rail.



Rail has been hoisted about a foot above ties. Tong man is striking trip trigger to release carriage.

The improved Type C Meco Rail Layer is a low-cost, light-weight, high-capacity machine of simple design. It is powered by a 2-cylinder, 4-cycle, air-cooled, 10 H. P. engine, with governor. It is hauled to and from the job by a track motor car which requires no train orders.

The Rail Layer re-lays the rail on one side of the track, the new rail being spiked in place. After laying one side, the crew turns the Rail Layer around, using the set-off and turntable device, and the opposite rail is re-laid, gaged and spiked. Rail is also readily laid on bridges and in tunnels.

Its crew of 3 or 4 men easily moves the machine to the opposite rail, across the intertrack, or sets it off track to clear traffic by means of the *Meco Set-off and Transfer*. This device, weighing 135 lbs., is carried on the Rail Layer when not in use.

A few of the new *Type C Meco Rail Layers* are ready for early delivery.

★ Maintenance Equipment Company ★

RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS

Carriage has rolled down against a "stop" at gauge position. Operator releases grip on running rail.

Operator is moving suspended rail into position.

Operator is lowering rail on tie plates and against expansion shim.

R-3441

Railroads all over America stretch maintenance dollars with *PRESSURE GROUTING*

FROM COAST to coast leading railroads are stretching maintenance dollars by stabilizing their track with portland cement grout. Pressure grouting ends troublesome water pockets and soft spots, stabilizes fills, lengthens rail and tie life and increases the load-carrying capacity of the treated sections.

Pressure grouting has proved its worth under all types of traffic and subgrade conditions throughout the country. Many of the more than 50 railroads that have tried this method of roadbed stabilization are employing it as routine maintenance practice—and earning returns up to several hundred per cent of the original investment.

In addition to reducing maintenance cost, portland cement pressure grouting improves operating conditions, permits increased speeds, provides greater safety, allows heavier tonnage limits, insures smoother-riding track and more passenger comfort.

For more information about this proven method of track stabilization write for free, illustrated technical bulletin, "*Stabilizing Railroad Track by Pressure Grouting.*" Distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION

DEPT. A9-27, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

INTERNATIONAL DIESEL crawlers deliver the maximum amount of work for the fuel consumed. They handle loads that pay. They'll work continuously on the job, without flagging. Secret of their ability to drive through tough going is the reserve lugging ability of their powerful diesel engines. In the sensitive speed governor, a torque boosting device acts instantly to increase engine torque as much as 15% when the load demands it. ● "Scotch" with fuel and lubricants, yet tireless on the long grind, Internationals are the tractors to fulfill your most exacting requirements. Your International Industrial Power Distributor can supply the size crawler you need—now.

INTERNATIONAL HARVESTER COMPANY • Chicago

One of the many maintenance-of-way jobs which this International TD-9 does, economically and efficiently, is widening and ditching a cut to keep water off a newly rebuilt road-bed.

Standardize on Power that Pays

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

INTERNATIONAL HARVESTER

INTERNATIONAL INDUSTRIAL POWER

Efficient Rail Laying Gangs are MECHANIZED ... with NORDBERG MACHINES

SPIKE PULLERS . . . fast spike pulling by machine speeds up re-laying and reduces the cost of the entire operation.

POWER TRACK WRENCHES . . . bolts in old rail joints removed with power wrench.

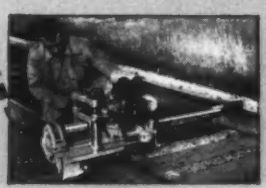
ADZING MACHINES . . . provide tie seats in keeping with today's maintenance standards — all level and in same plane.

RAIL LAYING CRANE HERE

TRACK WRENCHES . . . Bolts of new rail tightened with uniformly controlled torque.

NORDBERG GAGING TEAM . . . consists of one man operating TRAKGAGER, one man on the SPIKE HAMMER and two men with SPIKE HOLDERS doing the gage spiking.

SPIKE HAMMERS . . . At this point Nordberg Spike Hammers take over for fast, accurate driving of new spikes.



RAIL DRILLS . . . for high-speed drilling of bolt holes in closure cuts. Light weight, easily handled by one man.

"X" Marks the Spot where a specific operation in rail laying jobs can be handled faster, more efficiently, with Nordberg Track Maintenance Machines. Starting with the removal of old spikes . . . right on through the final operation in laying of new rail . . . each Nordberg Machine is designed to handle its job with speed and accuracy.

Mechanization with Nordberg Machines is the answer to costly, time-consuming maintenance operations. It will pay you to investigate how you can accomplish more with the time and labor saving advantages of Nordberg Machinery. Write for descriptive bulletins on any or all of the equipment shown here.

Look to NORDBERG

NORDBERG MFG. CO., Milwaukee 7, Wis

. . . for continually improved TRACK MAINTENANCE MACHINERY to do a Better, Faster Maintenance Job at Lower Cost.

Make your own check on Continuous Rail Economy Fill in the Answers

What do joints now cost on your railroad, assuming that average rail life is 25 years?

	Cost per year per mile of track
1. Original bars, bolts and washers with labor to install	$_____
2. Signal bond installed	_____
3. Flame-hardening rail ends	_____
4. Tightening track bolts	_____
5. Tamping joint ties	_____
6. Maintaining signal bonds	_____
7. Building up rail ends	_____
8. Reforming angle bars	_____
9. Renewing angle bars	_____
10. Joint tie replacement account of mechanical wear	_____
11. Replacing fouled ballast account of pumping joints	_____
TOTAL	$_____

Continuous rail eliminates practically all of these costs. One railroad estimates that continuous rail, pressure-welded by OXWELD'S methods, saves them $383 per mile per year. You can save from $7,000 to $10,000 per mile during life of rail in first position.

Booklet F-7225 tells how continuous rail is efficiently pressure-welded by OXWELD'S methods. Write for it.

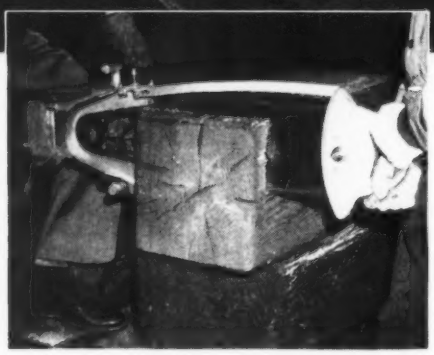
THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation

UCC
Carbide and Carbon Building Chicago and New York
In Canada:
Canadian Railroad Service Company, Limited, Toronto
The term "Oxweld" is a registered trade-mark.

SINCE 1912—THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

Only 27 lbs.

But Look at the Performance You Get



When very accurate cuts are necessary a helper's handle is easily attached to insure precise cuts at any angle.

Small, compact and easily handled, the Homelite Chain Saw gets in and cuts where larger saws are unworkable.

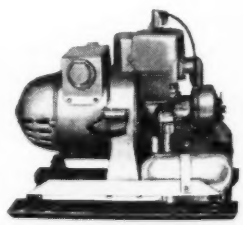
Here, for the first time, is a small saw that does the work of a big saw . . . a modern, high cycle electric chain saw that can be handled by one man with complete ease. Extremely fast and efficient, this saw cuts heavy timber and trees up to 36″ diameter in amazingly low time. And because of its light weight . . . only 27 lbs. complete . . . it is easily operated no matter where your cutting is necessary.

Another important point, with a Homelite Chain Saw you get *electric* chain saw efficiency everywhere . . . even in remote locations . . . for you operate your Homelite Chain Saw with a Homelite Dual Purpose Generator, a *carryable* generator that can be picked up and easily transported to any job at any location.

Your Power Unit For a Plus Performance

A Homelite Dual Purpose Generator is really a *multi-purpose* generator. You can use it not only for your Homelite Chain Saw but for operating both high cycle and standard universal 110 volt tools plus floodlights on emergency night work.

See how this is done. Write, today, for our new Homelite Chain Saw bulletin.



HOMELITE

CORPORATION

209 RIVERDALE AVENUE, PORT CHESTER, NEW YORK

MANUFACTURERS OF HOMELITE CARRYABLE PUMPS • GENERATORS • BLOWERS • CHAIN SAWS

THE IMPROVED GAUTIER RAIL ANCHOR

The need today for railroads to keep their maintenance-of-way costs to a minimum, highlights the desirability of the Improved Gautier as a labor saving anchor . . .

- ★ It is quickly and easily applied with a maul or spike maul.
- ★ It requires very little maintenance once installed.
- ★ It lasts the life of the rail.

Other Outstanding Features Are:

- It is a heavy one piece drive-on anchor made of alloy steel.
- **It can't be overdriven.**
- It retains its holding power on re-application.
- It is designed for use on old rail as well as new.

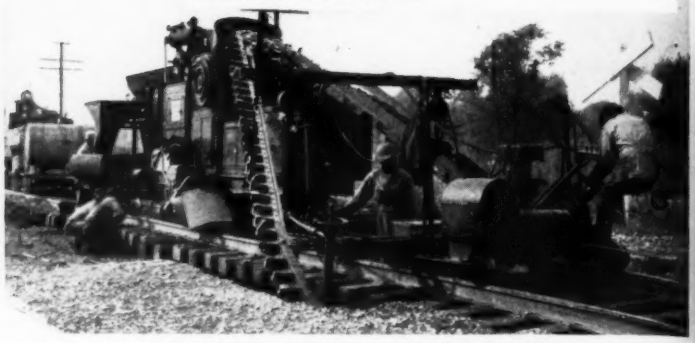
Write for Complete Information

MID-WEST FORGING & MANUFACTURING CO.

General Offices: 38 So. Dearborn St. • Chicago 3, Ill. • Mfg. Plant • Chicago Heights, Ill.
Eastern representative: Moore and Steele Corp., Owego, Tioga County, N.Y.

Rear end of cleaning unit, showing disposal conveyor above, ejecting waste to the side, and delivery conveyor below distributing cleaned ballast.

Ballast Cleaner includes two units: a towing and digging unit shown at the right, and a Diesel-powered cleaning unit behind. An endless scraper chain passing beneath the track excavates the ballast, which is elevated first by the digging chain itself and then by a belt conveyor to vibrating screens, where it is freed of waste and conveyed to a chute for redistribution beneath the ties.



2 new machines

Also: Universal Bolt and Tie Screw Driving Machines, Rail Drilling Machines, Tie Drilling Machines, Pulsators, Motor Rail Trucks

The Matisa Automatic Ballast Cleaner and the Matisa Automatic Tie Tamper, both developed in Switzerland and experienced in track maintenance service in England, France, and Belgium in the past 12 years, are now available to American railroads.

Both are self-propelled on-track machines. Output for the Ballast Cleaner is 150 to 240 lineal feet of track per hour of actual uninterrupted operation, depending on ballast conditions. The Tie Tamper, requiring only one man to operate, will tamp 400 to 600 feet of track per hour under normal conditions.

Full details and work records on request.

Front view of the power tamper

The MATISA EQUIPMENT CORPORATION
206 S. Michigan Ave., Chicago 4, Ill.

EQUIPMENT COMPANY
58 Victoria St., London S.W.1, England

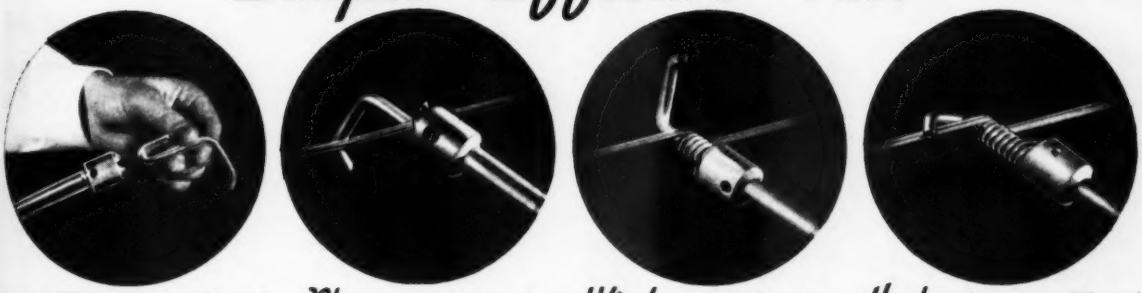
MATERIEL INDUSTRIEL, S. A.
2 Grand Pont, Lousanne, Switzerland
30 Rue de Mogador, Paris, France

MATERIAIS INDUSTRIAIS, S. A.
277 Av. Rio Brance,
Rio de Janeiro, Brazil

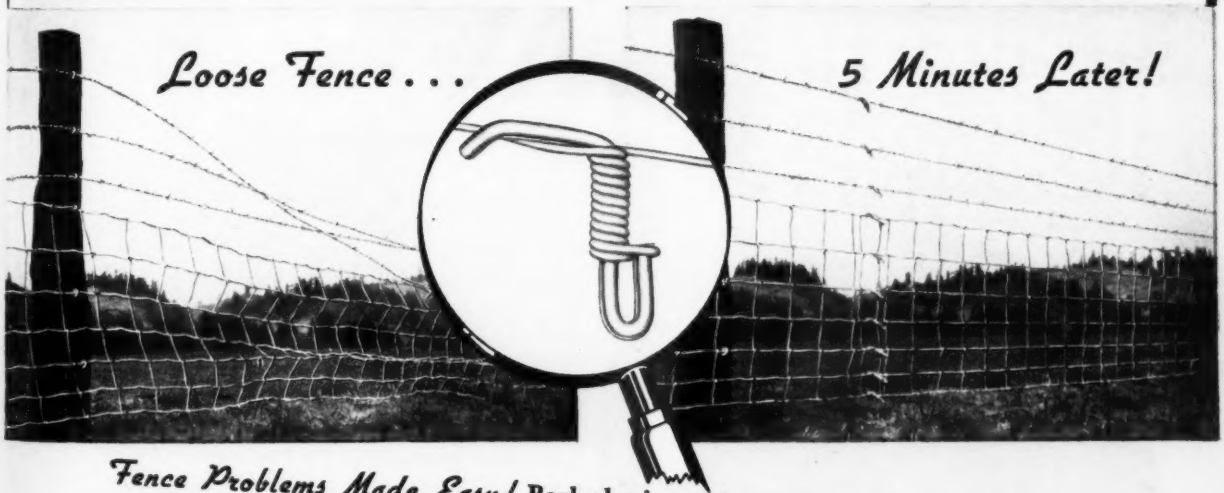
Opposed pairs of tamping tools work from each side of a tie, vibrating rapidly while being forced toward each other until desired compactness of ballast under tie is attained.
Two complete tamping mechanisms (one on each side), each comprising 8 tamping tools working in pairs, 4 inside and 4 outside of rail, are raised and lowered by means of compressed air. They are mounted on the Tie Tamper, which is powered and propelled by a combustion engine

BENBOW FENCE TIGHTENER

Simple – Effective – Fast



Insert Tightener in Wrench— *Place* over fence wire— *Wind* up slack in wire— *Hook* and remove Wrench



Fence Problems Made Easy! Barbed wire and woven wire, both new and old, are effectively stretched and repaired with this simple method. Slack pulls in with a few turns of the wrench. Since the tighteners stay in the fence, it is a simple matter to retighten your fence at any time for years to come.

Saves time — saves labor! Order now — don't delay!

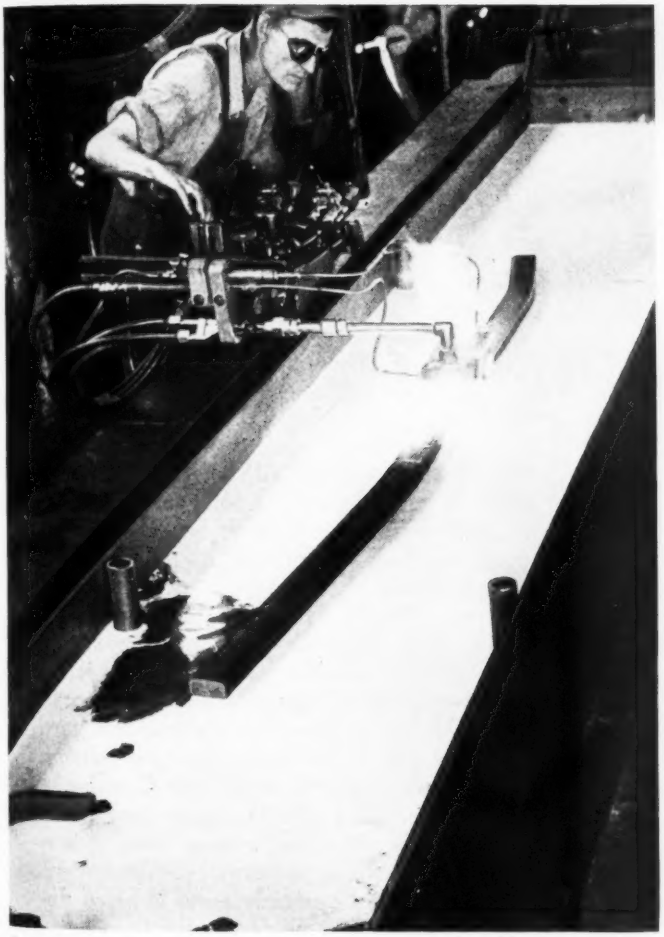
BENBOW Fence Tightener Co.

BENBOW, CALIFORNIA

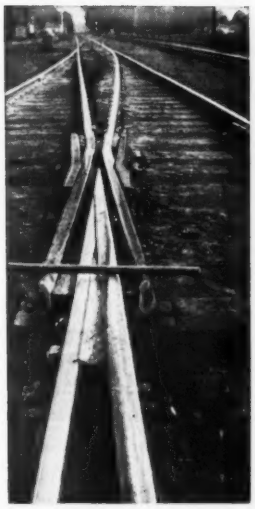
Manufacturers of Fence Tighteners for Barbed Wire and Woven Wire Fencing

TWO YEARS' SERVICE...

proves flame hardening of frogs cuts frog replacement and maintenance costs of rolling stock



Setup showing the flame hardening operation with special quenching bath.



Here you see the wear behind the heat treated area, and get some idea of the traffic over the frog.

Several years ago, open-hearth carbon steel frog service life in certain locations on one of America's leading railroads averaged six months — replacement costs ran high.

In August 1947, Airco's modern flame hardening method was introduced, and flame hardened frogs were installed on switching leads — points where they would receive the greatest abuse.

A continuing test on these flame hardened frogs was made. It was found that after hardening the frogs about 32 inches on the wing, and 20 inches on the point, the rate of wear on the wing and point was uniform over a two-year period. This meant a drastic reduction in shock to the rolling stock — reduced maintenance costs.

The Airco flame hardening process is simple and economical. It is flexible and selective for application in the shop on small or large objects — flat or circular surfaces. Its outstanding quality is, it provides sufficient surface hardness to retard wear without affecting toughness or shock resistance of the core metal.

For further details about this process, write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company. On West Coast: Air Reduction Pacific Company.)

Costs Come Down Under The Airco Plan

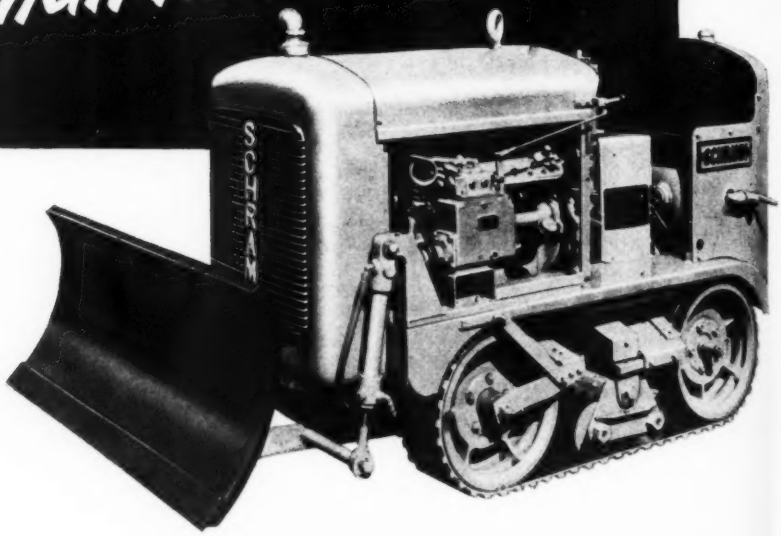
AIRCO

AIR REDUCTION

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and Other Gases . . . Calcium Carbide . . . Gas Cutting Machines . . . Gas Welding and Cutting Apparatus, and Supplies . . . Arc Welders, Electrodes and Accessories

Same work to do... Fewer man-hours to do it



What a Chance for the

SCHRAMM MODEL 60 CRAWLER!

Quality SCHRAMM Features . . .

Balanced Power. Two compressor and two power cylinders balanced in each side of V-8 block.

Positive Cam-Operated Intake Valves with SCHRAMM patented unloader that holds valves open during unloading.

Pressure Lubrication to all main and crank pin bearings; spray and splash to all interior parts.

Electric Starting with heavy-duty storage battery and battery charging generator.

Transmission; 4 forward speeds and reverse. Famous SCHRAMM dependability throughout.

Other SCHRAMM compressors range from 20 to 420 cubic feet actual air capacity, portable and stationary; gasoline, diesel and electric driven.

Under the 40-hour week, greater mechanization is an absolute MUST! Yet you can't afford a special machine for *every* job, particularly the occasional one. So consider this *single* machine, adaptable to *many* uses besides its main one. Basically it's for your most important work — tie-tamping — and most other compressed air jobs on the railroad, because its powered crawler treads take it *anywhere*. *In addition*, it's a light tractor, a back-filler, snow plow for station and yard areas, or power for belt-driven machinery. It's the SCHRAMM Model 60 Crawler, a rugged, compact mobile compressor that's made a hit with maintenance men everywhere. No other compressor matches its versatility. And certainly none is more dependable. For it is built and proudly offered by America's oldest exclusive compressor manufacturer.

You'll want full details, of course. To get them, drop a line to "the compressor people" today. Ask for Bulletin FC 49.

SCHRAMM INC. THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

On Rail Joints

NO-OX-ID MEETS THE JOB CONDITION IN TWO MONEYSAVING WAYS

Safety. The nondrying quality of NO-OX-ID provides a perfect lubrication for the fishing area of the rail joint. Note in the illustration below how bolt holes in the unprotected rail ends have been worn oval, resulting in great strain on track bolts and probable breakage. Recent tests on rail joint slippage machine indicated NO-OX-ID to be a most effective lubricant, and that it had a lower coefficient of friction than all other materials tested.

Low Maintenance Cost. Weathering properties of NO-OX-ID indicate a long service life. The plastic base of NO-OX-ID serves a two-fold purpose: (1) It furnishes a body for the chemical inhibitors; (2) It provides a permanent wetting effect which maintains an intimate contact for the inhibitors with metal surfaces. Lubrication plus rust prevention, plus a long service life, insures economy, which means low maintenance costs.

← *Unprotected*

SAFETY HAZARD

COSTLY

Protected →

SAFE

LOW MAINTENANCE

COSTS

STANDARDIZE ON NO-OX-ID FOR GREATER SAFETY AND LOWER MAINTENANCE COSTS

Dearborn
Reg. U. S. Pat. Off.

THE LEADER IN RUST PREVENTIVES AND BOILER WATER TREATMENT

DEARBORN CHEMICAL COMPANY

310 S. Michigan Ave., Chicago 4 • 807-15 Mateo St., Los Angeles
205 E. 42nd St., New York • 2454 Dundas St., West, Toronto

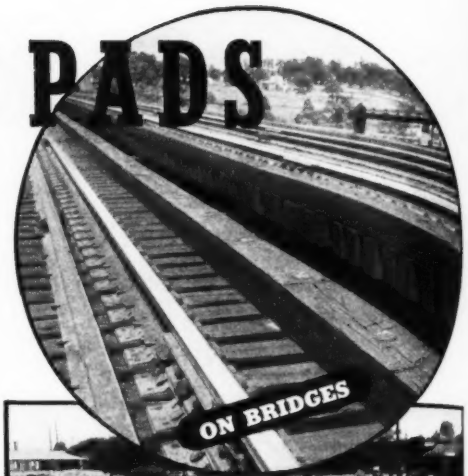
FABCO TIE PADS

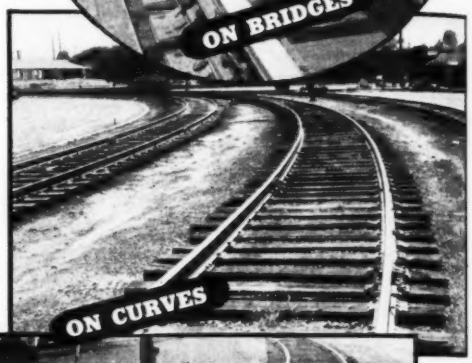
REDUCE MECHANICAL WEAR OF TIES

By reducing the plate cutting of ties Fabco Tie Pads save you money in two ways. (1) They extend tie life. (2) They reduce to a minimum the need for regauging.

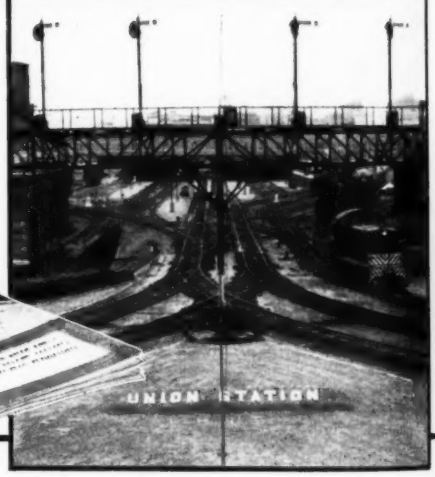
17 REASONS WHY YOU SHOULD USE FABCO TIE PADS

1. Prevent cutting of ties by plates.
2. Extend tie life.
3. Reduce labor costs by less frequent tie renewal.
4. Maintain gauge.
5. Save labor of regauging.
6. Have exceptionally long life — comparable to tie life.
7. Withstand extremes of temperature, moisture, brine, sand.
8. Have great strength under load.
9. Do not squash or crush under extremes of temperature or long service.
10. Permanent resiliency assures tight spikes.
11. Resilient winter and summer.
12. Cushion track structure from impacts.
13. Assist in maintaining line and surface.
14. Large tie plates unnecessary.
15. Compensate uneven bearing surfaces.
16. May be transferred from one location to another.
17. Low pad cost.





and STATION APPROACHES



Made by the Makers of Fabreeka with over 15 Years Experience in Track

FABREEKA
PRODUCTS COMPANY
INCORPORATED
222M SUMMER STREET
BOSTON 10, MASS.

NEW YORK
DETROIT
CHICAGO
PHILADELPHIA
SPARTANBURG
OAKLAND

Please send me latest Fabco Tie Pad literature.

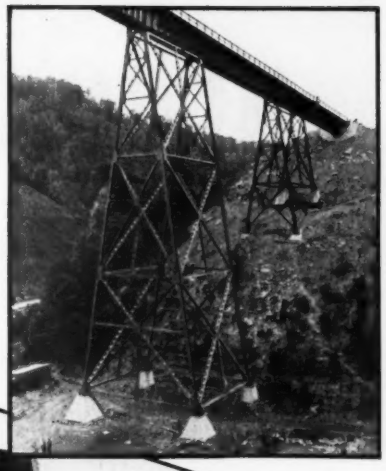
NAME .....

FIRM .....

ADDRESS .....

FABREEKA TRACK PADS

ABSORB HEAVY IMPACT SHOCK AND PRESERVE TRACK STRUCTURE

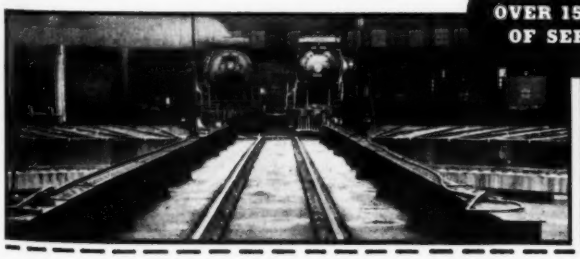


The laminated construction of Fabreeka Track Pads insures the utmost in strength, life and ability to cushion heavy impact shocks. They are widely used in track structure at such points as crossings, turntables, track scales, in place of ties on steel and concrete decked bridges, and between bridge supports and concrete foundations.

WHY YOU SHOULD USE FABREEKA TRACK PADS

1. To insure an even bearing surface between steel and steel or between steel and concrete.
2. To properly distribute heavy loads.
3. To prevent cracking, chipping and flaking of concrete foundations.
4. To reduce turntable maintenance costs.
5. To increase the life of manganese points on crossings.
6. To lengthen the life of bridge structure.
7. To reduce track scale maintenance.
8. To reduce cost of excavation and concrete work on underpasses by eliminating ties and ballast beneath rails on steel and concrete decked bridges.

"PROVED BY OVER 15 YEARS OF SERVICE"



Please send me latest literature on Fabreeka Track Pads.

NAME.....

FIRM.....

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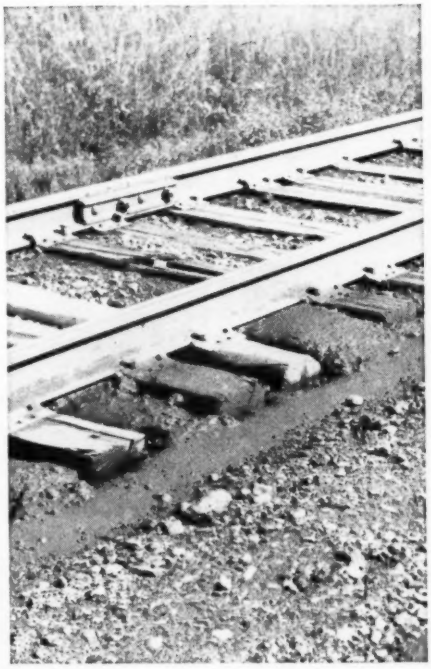
You can't sue a subgrade for lack of support



When water-filled subgrades are guilty of non-support they cost you plenty in excessive maintenance. Then the only way to keep roadbeds firm, smooth and stable is to drain the water out and keep it out. You can do this with ARMCO Perforated Pipe.

Efficient, economical subdrainage comes easy with ARMCO Pipe. Unskilled workmen quickly join long lengths with simple band couplers. There are fewer sections to lay—fewer joints to assemble. Installation goes fast and labor costs are low.

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BUT IT'S EASY with a GRADALL

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The Gradall is efficient on practically *all* tough road jobs, cleaning ditches, laying pipe, digging, backfilling, serving a hundred ways.

To understand the all-round versatility and surprising accuracy of a Gradall, watch it in action. This single machine, applicable to so many jobs, is a decidedly profitable investment for contractors and maintenance departments.

Here the Gradall is cleaning out accumulations of muck and silt from open concrete culvert—ordinarily a time-taking, laborious hand job.

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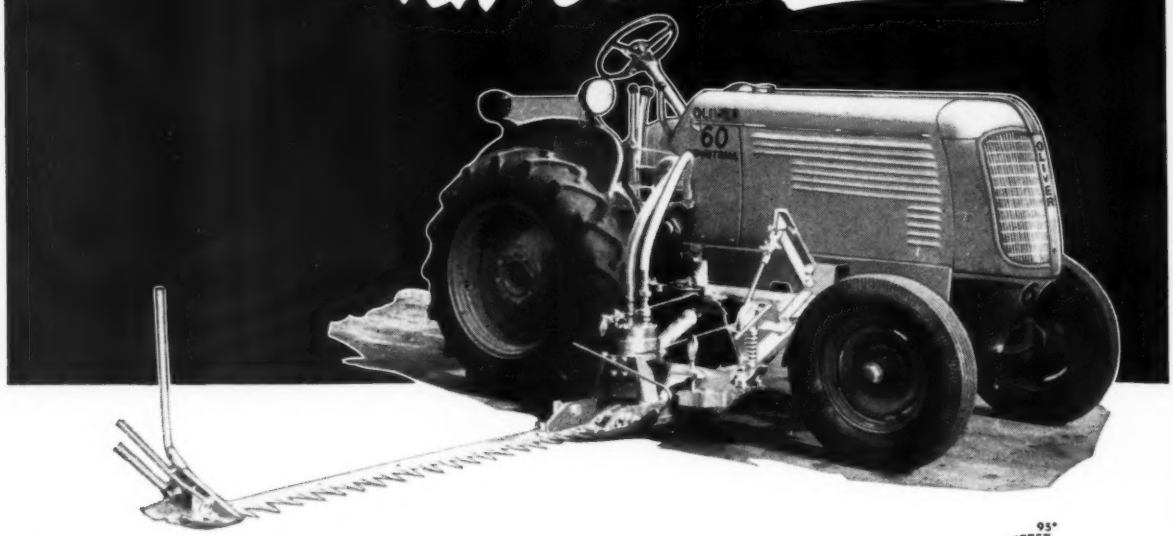
GRADALL DIVISION
WARNER & SWASEY
Cleveland

GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE

Now a Hydraulic Driven Cutter Bar ..that cuts costs!

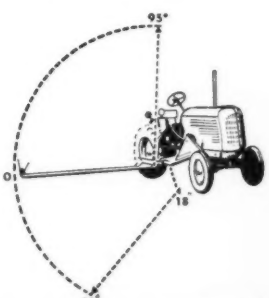


Here's the really new mowing unit that cuts mowing costs on anything from thick matted grass to moderate brush. Oliver Model "60" and "77" Industrial Wheel Tractors and Davco Hydro-Mowers assure lowest cost per mile of mowing. Here's why!

The hydraulic motor drive of the knife makes possible smooth operation. Hydraulic safety mechanism practically eliminates damage to the knife that might be caused by refuse in the mowing path.

This efficient, new unit will mow at any angle from 55° below to 95° above the horizontal. Constant speed hydraulic power enables the mower to cut right up to an obstruction. Finger-tip control that instantly raises the cutter bar hydraulically to clear obstructions... full visibility . . . and lack of vibration effectively reduce operator fatigue . . . permit more work to be done per day.

Oliver Industrial Wheel Tractors and Davco Hydro-Mowers are the ideal units for highways, railroad right-of-ways, parks, airports, and plant grounds. Your Oliver Industrial Distributor will be happy to give you all the facts on lower mowing costs. Or if you prefer, write direct to The Oliver Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.



Hydraulically operated cutter bar will mow at any angle from 55° below to 95° above the horizontal. The shoe can be raised 18 inches above the ground level.

THE OLIVER CORPORATION

A Complete Line of Crawler and Industrial Wheel Tractors

THE OLIVER CORPORATION

"THE SIGN OF EXTRA SERVICE"

cost cutters

for

bridge maintenance

With the CP-3140 Wire Brush Machine, paint, rust or scale is speedily removed from metal surfaces. Brush diameter 6". With pistol grip, overall length is 18½", weight 12½ lbs.

Scale, rust or paint is easily removed, without any damage to the metal underneath, by the very rapid vibratory action of the CP-402 Scaler. No chisels are required, as the hammer piston itself acts as the chisel. Also available are triple piston models.

It's easy to run nuts and apply or remove bolts, studs and lag screws, with a controllable power CP-365 Reversible Impact Wrench (illustrated). Absence of twisting or kickback, and only slight vibration minimizes operator fatigue. Other CP Impact Wrenches from ½" to 2" bolt size.

These, and other CP Pneumatic Tools are described and illustrated in Catalog 564. Write for copy.

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WITH THE NEW

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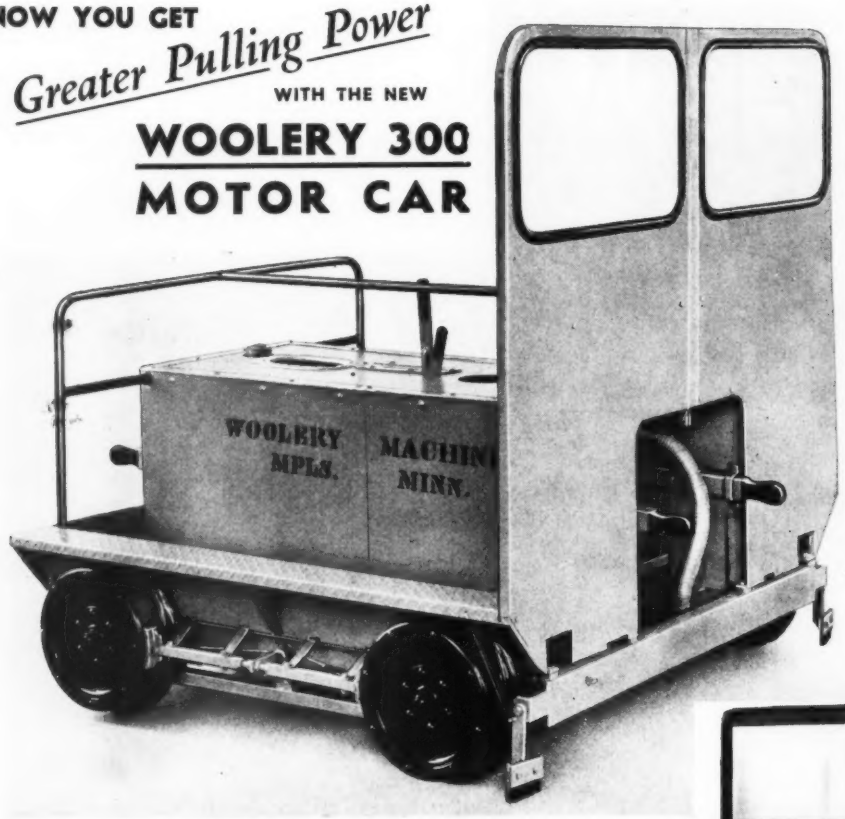

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- New 4 wheel drive
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- Woolery 2 speed transmission, forward and reverse
- New self centering cast iron brake shoes on all 4 wheels
- 10 HP air cooled engine
- One man can remove from rails at a crossing
- Carries 8 men and track tools

The Light Weight Motor Car . . . with Heavy Duty Performance!

The WOOLERY 300 Motor Car sets a new standard for motor car performance. Designed for heavier loads, greater dependability, and easier handling by extra gang or section crews, the WOOLERY 300 Motor Car provides new features that make it more adaptable to modern track maintenance.

Efficiently designed . . . sturdily built . . . compact, the WOOLERY 300 is powered by a 4 cycle air cooled engine (either Onan or Wisconsin) that reduces car weight, eliminates anti-freeze in winter, and provides pulling power usually found only in far heavier cars. New selective differential permits use of 4 wheel drive and still provides differential action when removing car from tracks.

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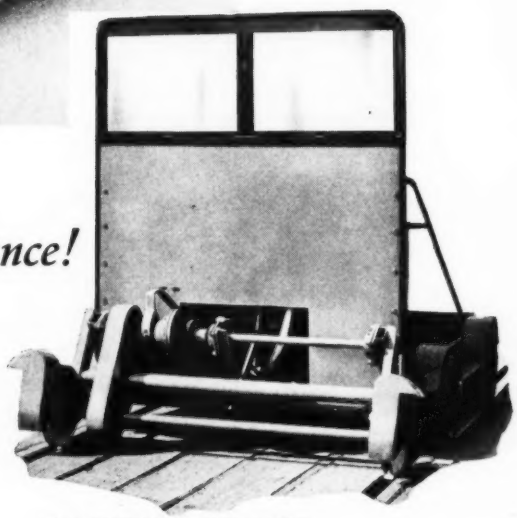
In recent tests, the new WOOLERY 300 Motor Car with 4 wheel drive providing greater traction, easily pulled 15,000 pounds. Greater pulling power is only one of the many advantages of the "300".



FLANGEWAY CLEANER IS QUICKLY ATTACHED

In winter, when track conditions require the safety of clean flangeways, a WOOLERY Flangeway Cleaner is quickly added with only 6 bolts. This provides you with an efficient self-propelled unit that cleans both flangeways at one time. Sanders may also be added for wintertime use if desired.

WRITE FOR NEW BULLETIN #178 giving complete specifications of the WOOLERY 300 MOTOR CAR.

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Ingersoll-Rand SPOT-AIR

The SPOT-AIR not only saves time on the job...it also speeds-up the move. This small, gasoline-powered, air-cooled unit is the lightest, most compact section-gang compressor ever developed . . . two men can carry it easily, or it can be put on a section car for the longer hauls. A specially designed wheelbarrow mounting makes it possible for one man to handle both the SPOT-AIR and Air Tools.

The SPOT-AIR is ideal for use with two new Ingersoll-Rand MT-4 Tie-Tampers . . . and in combination with Ingersoll-Rand Impact Wrenches, Drills, Grinders, and many other Air Tools, it is just right for bridge and building, grade-crossing and signal maintenance, and numerous emergency jobs.

Engineered for economical operation and built to Ingersoll-Rand's high standards of quality, the SPOT-AIR Compressor can give you better, faster work at a real saving in time, labor, and costs.

The modern light-weight compressor for railway maintenance.

COMPRESSORS • AIR TOOLS • ROCK DRILLS
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When a signalman is needed on the double . . . when there's an inspection job to be done . . . and for a wide range of other maintenance assignments . . . put your faith in a Fairbanks-Morse Motor Car. It's a long-time railroad habit, justified by well-proved, built-in dependability. Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE,

a name worth remembering

DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

RAIL-TEL switch heaters keep yard traffic *Free Flowing*

Above is shown a typical example of what can be accomplished during a winter storm with propane gas switch heaters. At the first sign of snow, these efficient, low-cost heaters go into action. Big storm or little storm—you are protected for the duration—traffic remains fluid throughout the yard.

These propane gas switch heaters are equally valuable out along the line providing reliable, economical protection for your spring and power switches. They are particularly useful in C.T.C. territory. RAIL-TEL Switch Heaters are operated by manual control but are designed so that they may be used with remote control if desired. The Rails Company furnishes Hot Wire and Electronic (Spark) Automatic Ignition Units for operation with C.T.C., Carrier, or Direct Wire control from the nearest tower, on either A.C. or D.C. current. These heaters are simply installed and propane gas is supplied through pipe lines from cylinders of various capacities in manifold, or bulk storage tanks.

Keep your switches open the modern—economical way—*use propane gas.* Act *now* before winter sets in.

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BARCO TYTAMPER

handles *more* kinds of jobs more places

For over eleven years the light, portable Barco Unit Tytamper has been doing spot or gang tamping, cribbing, breaking, drilling and winter ice service. And, year after year, Barco has shown it can do *more* kinds of jobs, yet save money both on first cost and maintenance. It is not necessary to clean out cribs of "cemented" ballast before tamping if BARCO tytampers are used. For more information, write Barco Manufacturing Co., 1805I Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Canada.

BARCO
UNIT TYTAMPERS

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

No. 249 of a Series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION
79 W. MONROE STREET
CHICAGO 3, ILL.

Subject: Our Exhibit

September 1, 1949

Dear Readers:

Recognizing the vital role that machines and materials must play in the efficient and economical maintenance of the tracks and structures of the railways under the 40-hr. week being ushered in among the maintenance forces this month, it seemed imperative that there be an exhibit of equipment and materials again this year in connection with the Roadmasters' and Bridge and Building Association conventions in September. Accordingly Railway Engineering and Maintenance has provided one—an Exhibit-in-Print—which is presented continuously throughout the pages of this pre-convention issue.

Of course, such an exhibit can't take the place of a real display of the machines and materials in which you are interested—many set up to afford demonstrations—but it is the best substitute within our power, and we hope that it will prove of interest and value to you. Certainly, for those of you who might not be able to come to the conventions in Chicago this month, even if a real exhibit were to be held, our Exhibit-in-Print is an "extra", and we hope a real service. We hope, too, that it proves a service to the more than 115 manufacturers represented.

Why not view this exhibit from beginning to end, "booth" by "booth", figuratively walking down the aisles, studying each product and endeavoring to see how it can fit into your scheme of things—help you improve your work and cut costs? And if you want detailed information concerning specific products, we suggest that you avail yourself of the convenient means to secure such information afforded by the postage-free "request" postcards appearing on page 835 of this issue.

Railway Engineering and Maintenance is leaving no stone unturned to keep you advised of all developments in materials, power tools and machines that may help you in your work. In addition to contacting more than 200 manufacturers in connection with our Exhibit-in-Print, our staff has witnessed more than 50 different types of roadway machines in field operations during the last two months, and within the last 30 days alone has made seven special trips, some to distant points, to see new equipment on test or in regular service. Some of this equipment is described in the "Products of Manufacturers" section of this issue. Other units will be presented in subsequent issues, with the completion of manufacturers' "shake-down" tests.

In your greater need for ways to hold down costs under the 40-hr. week, we suggest that you watch our pages—both editorial and advertising—more closely than ever before. Many new and improved products are in the making, and Railway Engineering and Maintenance will keep you informed concerning them.

Sincerely,

Neal D. Howard

NDH:ag

Editor

Fifteen Years...
Only Two Models

The first Raco Power Track Wrench was manufactured for eleven years (1934—1945). All parts were kept interchangeable.

The second Raco Power Track Wrench is now nearly four years old (1946—1949).

In this also, we expect to maintain interchangeability of parts.

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Better maintenance

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Performance ON THE JOB COUNTS

"The Work Horses of the Railroads"—that might very well be the most apt phrase one could use to describe Fairmont's Standard Section Motor Cars. For these versatile, reliable cars have seen millions of miles of service on all kinds of assignments for railway maintenance crews all over the world. Today's Fairmont cars are better than their famous predecessors—because they are the logical product of over 40 years of experience concentrated on the one job of building ever finer, ever more practical railway maintenance equipment. It's no wonder, then, that every piece of equipment to bear the Fairmont nameplate has been designed to live up to the idea that "Performance on the Job Counts." . . . Fairmont Railway Motors, Inc., Fairmont, Minnesota.

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1081 National Press Bldg.

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Member of the Associated Business Papers (A.B.P.) and of the Audit Bureau of Circulations (A.B.C.), and is indexed by Engineering Index, Inc.

PRINTED IN U.S.A.

Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

VOL. 45, NO. 9 SEPTEMBER, 1949

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MERWIN H. DICK, *Managing Editor*
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WALTER L. TURNER, JR., *Eastern Editor*
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America's most complete line of track specialties

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MANGANESE STEEL GUARD RAILS

RACOR

Provide safety and economy on the Chicago and North Western Railway

Racor No. 22 Heavy Duty Automatic Safety Adjustable Switch Stands have been installed with the track facilities serving the North Western's new Chicago Diesel Shop. Recommended for all busy switching turnouts that are frequently run through, these stands operate either manually or automatically. Adjustment to fit slight variations in the throw of switches is provided by a heavy 1¾" diameter adjustable crank eye. Target and lamp rotate with switches whether thrown manually or automatically. During automatic operation the hand lever remains stationary. Write for descriptive literature.

RAMAPO'S GREATER EXPERIENCE AND FACILITIES ARE READY TO SERVE YOU

AMERICAN Brake Shoe COMPANY

RAMAPO AJAX DIVISION

109 North Wabash Avenue, Chicago 2, Ill.

September 1—

Can Prove a Milepost Toward Progress or a Calamity

"F"-day, inaugurating the 40-hr., 5-day week for nearly 1,000,000 non-operating employees of the railroads, is at hand. Effective September 1, these employees will work eight fewer hours a week for the same pay, which, plus the seven cents an hour increase made effective October 1 last, will raise wage costs an average of about 26 per cent per employee. In the maintenance-of-way and structures departments alone, nearly 250,000 employees are involved, and millions of dollars a year are at stake. What now? The answer to this question is of vital importance to the railroads.

Railway Engineering and Maintenance is numbered among those who see in the new order a great emergency—an emergency which, unless met promptly and effectively, will threaten the existence of the railways as private industry. The emergency is the greater because the threatened further rise in costs comes at a time when railway traffic and earning power are declining. The only answer to this emergency lies in new-found economies—economies through increased productivity per man-hour and a relentless war on unnecessary costs by every means at the command of the railways.

While deeply concerned, *Railway Engineering and Maintenance* is also numbered among those who are confident that the emergency can be met—but hastens to caution that belittling the problem won't do it; that half-way measures will be inadequate; and that a *status quo* attitude will bring sure failure. What is demanded is, first, full realization of the seriousness of the problem, and then a resurgence of determination on the part of every supervisory officer and employee to increase production, improve standards of construction and maintenance, and slash unnecessary costs to the irreducible minimum. The reaction must be as violent as the action; the remedy must be as radical as required. Nothing else will do.

Fortunately, with the right attitude on the part of officers and employees, the ways and means to meet the problem presented by the 40-hr. week are manifold. Included among them are further mechanization and the more intensive and intelligent use and maintenance of machines; greater permanence of construction and maintenance through the use of improved materials and methods; more careful planning and improved working organizations; more intensive and alert supervision; bold experimentation and research to reach out into the realm of every practicable possibility for improvements or economies; greater cooperation on the part of the operating department in giving the maintenance forces maximum uninterrupted use of the track during working hours and in minimizing calls for other than real emergency work; and the elimination of every conceivable practice or type of work which cannot be shown to promote better railroading, greater efficiency or increased safety.

To achieve even these ends to the degree necessary will call for a new approach—a new concept of action—on the part of many railroad officers and employees, with a critical eye toward every procedure, every operation—regardless of how it may have been done in the past. Yes, the coming of the 40-hr. week calls for a revolution in maintenance methods and practices. But it can be a successful revolution—with benefit to all—if there is the will and requisite effort on the part of railway managements, officers and employees to make it succeed.

Kenneth Cavins
President
Track Supply Association

G. R. Betts
President
B. & B. Supply Men's Association

Track and B

• This is the time of the year when the eyes and thoughts of railway maintenance men throughout the country begin to focus on Chicago—for the practice of holding simultaneous conventions of the Roadmasters' Association and the Bridge and Building Association in the Stevens Hotel at that point in September is now recognized as standard procedure. This year the meetings will convene at 10:00 a.m. Chicago daylight saving time on Monday, September 12, and will, as usual, run for three days.

A detailed program of the two meetings is printed elsewhere in this issue. In general the pattern will follow that of previous years, with the two groups generally meeting separately, but on several occasions coming together in joint sessions to hear addresses or to participate in other activities of mutual interest. Sessions of the Roadmasters' Associations will be directed by its president, R. L. Fox, division engineer, Southern, Alexandria, Va., and those of the Bridge and Building group will be presided over by E. H. Barnhart, division engineer, Baltimore & Ohio, Garrett, Ind., president of that association.

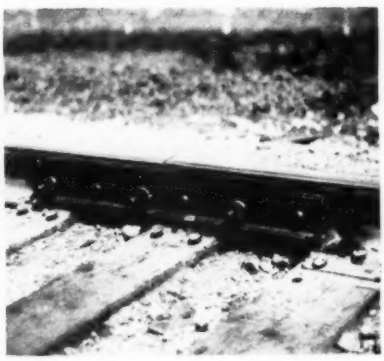
The presentation and consideration of the reports of technical committees will comprise the backbone of the separate sessions. The Roadmasters, in addition, will hear an address during the Wednesday

PRODUCTS "EXHIBIT-IN-PRINT"

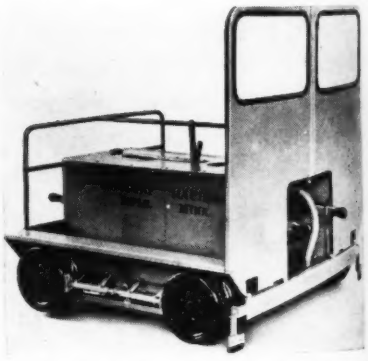
In the hope that it will in some measure compensate for the lack of an actual manufacturers' exhibit this year during the Roadmasters' and Bridge and Building meetings, we present in these pages a pictorial exhibit of products offered for use in the construction and maintenance of the railroads' track and structures. To obtain material for the "exhibit" each manufacturer, including every member of the Track Supply Association and the Bridge and Building Supply Men's Association, was requested to submit a photograph, with brief descriptive information, illustrating the one product that it would feature or emphasize most if an actual exhibit were to be held. Space limitations made it necessary to limit each company to a single product, although it was recognized that for many of them this stipulation would impose a difficult problem of selection in view of the large number of products offered by some individual firms. The material received in response to the request is presented in the form of a continuous "aisle" of "exhibits" extending through the feature section. Obviously, only a fraction of the available products is "exhibited"; to show all the meritorious materials, machines and devices would require volumes. While recognizing the shortcomings of the presentation, the thought arises that here is one exhibit that can be viewed in its entirety without any danger of getting sore feet.—Editor

SUPPLIERS EXHIBIT

Spot-Air compressor — Ingersoll-Rand Company. A gasoline-powered unit for the operation of tampers and other pneumatic tools. Light enough to be carried by two men and transported on a motor car. Equipped with a special wheelbarrow mounting for moving the Spot-Air compressor while on the job.



No-Ox-Id "A Special"—Dearborn Chemical Company. A chemically-inhibited compound of grease-like consistency, containing a solvent for ease of application. For lubricating rail joints and also protecting against corrosion. Can be used on new rail or where joint bars are being changed out.



Woolery No. 300 motor car—Woolery Machine Company. For section and extra-gang service. It has a four-wheel drive, a selective differential, a two-speed transmission, a draw-bar pull of 405 lb. and a load capacity of 10 tons. It is powered by a 2-cylinder, 10-hp., air-cooled gasoline engine.

B.&B. Men to Meet at Chicago

See page 882 for complete programs

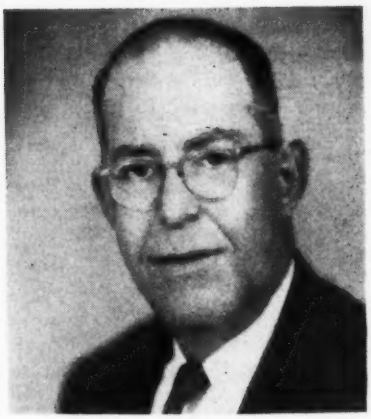
morning session on Railroading on the Pacific Coast, by G. L. Morrison, assistant engineer maintenance of way, Southern Pacific.

There will be a great deal of "meat" in the addresses to be presented during the joint sessions, including one on Tuesday morning by F. S. Schwinn, assistant chief engineer, Missouri Pacific Lines in Texas and Louisiana, dealing with railroad maintenance under the 40-hr. week. At another joint session on Tuesday afternoon the combined groups will hear C. J. Geyer, vice-president, construction and maintenance, Chesapeake & Ohio, speak on the subject What Now? You Can Help, and immediately afterward C. M. Kimball, vice-president in charge of safety, Southern System, will speak on Personalizing the Safety Concept. Two motion pictures will also be shown during this same session.

Another joint affair will be the annual banquet on Tuesday evening, which will be tendered to the members of the two associations and their families by the Track Supply Association and the Bridge and Building Supply Men's Association.

On Monday afternoon the two sessions will adjourn early to give the members an opportunity to visit the Railroad Fair, and on Wednesday afternoon each group will make an inspection trip of a local manufacturing plant.

E. H. Barnhart
President
American Railway Bridge and Building Association



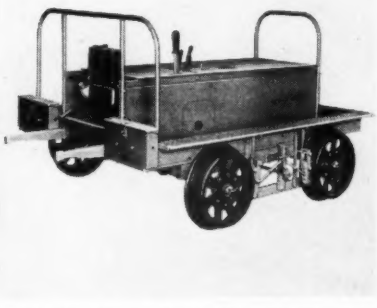
R. L. Fox
President
Roadmasters' and Maintenance of Way Association

RAILROAD FAIR DOES AN "ENCORE"

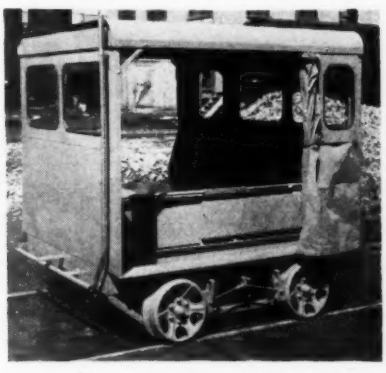
Refurbished, enlivened and expanded, the Railroad Fair is again holding forth on Chicago's lake front where, as last year, railroad lore and entertainment are offered in a highly attractive combination—equally palatable to laymen and railroad men alike. Back again are the pageant "Wheels A-Rolling," more entertaining than ever, and the railroad and other exhibits that delighted thousands last year, all revised or supplemented to enhance their interest and appeal. To these have been added an outdoor ice ballet, a "thrill" show featuring water ski artists, a replica of a frontier gold rush town, and many other attractions. The fair will close permanently on October 2.

PROVEN PRODUCTS

Fairmont M-19 Series F, four-man inspection car equipped with aluminum cab top—Fairmont Railway Motors, Inc. Spring mounted axle bearings. Heat-treated aluminum-alloy frame. New roller bearing engine with five-point cushioned mounting. Seat is removable for repairs. New adjustable lift handles.



Fairbanks Morse No. 55D general-purpose motor car—Fairbanks, Morse & Co. Has alloy steel frame, four-wheel self-centering brakes, aluminum spring-mounted axle boxes. Split-type rear axle sprocket can be replaced without removing either the axle or axle boxes. Operating levers have rubber grips.



Section motor car—Kalamazoo Manufacturing Co. The No. 56A, equipped with all-steel top and shatterproof glass windows. Weight of the car is so distributed that one man, using the extension handles, can lift it on and off the track at take-offs. Equipped with 10 hp. engine. Capacity, six men and tools.

Plans Mapped for the

In putting the five-day week into effect, railroad maintenance departments were faced with the necessity of making many far-reaching adjustments in working schedules, while at the same time keeping in mind the paramount need for economy. How have these adjustments been made and what is being done about the other problems presented by the shorter work week? To obtain information giving a cross-section of practice in these respects a questionnaire was sent to a selected list of roads. The replies are herein summarized.

• For better or for worse, the 40-hr. week has been put into effect in the maintenance-of-way and structures departments of the American railroads. The long weeks of tedious planning to make working schedules conform to the letter and the spirit of the agreement reached last spring between the roads and the non-operating unions, are now a thing of the past; ahead is a period of watching and waiting to see whether the arrangements made are going to work out in practice and whether further adjustments will be needed before it can be said that the best possible solution has been found.

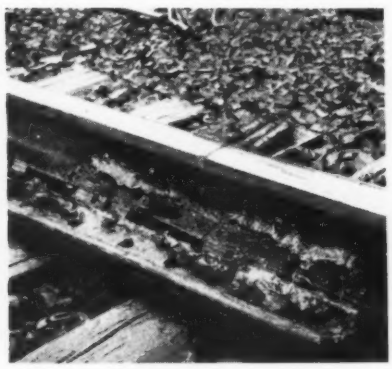
In the meantime a natural question on each road is: How have other roads settled the issues involved in the shorter work week? More specifically: To what extent do the adjustments made vary in detail between different roads? Have some lines been able to work out more favorable agreements with the brotherhoods than others? What steps are being taken or planned to counteract the large man-hour loss that has been sustained, without incurring exorbitant increases in expenses?

Readers of *Railway Engineering and Maintenance* will recall that this publication presented in its May issue an analysis of replies that had been received from a number of railroads to a questionnaire on the 40-hr. week. At that time the task of planning for the shorter work week was in its early stages and many questions could be answered only tentatively, if at all. The principal purpose of the earlier questionnaire was to obtain information that would be of help to our readers by revealing to them the thinking being done on other roads. Early in August another questionnaire was distributed to a limited list of railroads, including most of those included in the previous survey, to obtain information, insofar as it was available at the time, regarding the final plans for putting the 40-hr. week into effect. Replies were received to this questionnaire from 13 large roads, scattered all over the country. These replies are analyzed in the following.

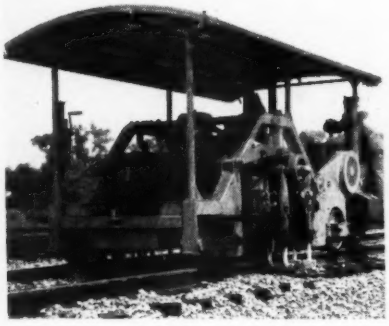
In contrast to the earlier survey, when 4 of the 14 roads replying expected to stagger their section gangs in order to have some of them working on Saturday, none of those replying to the latest questionnaire plan such an arrangement on more than a limited scale. Four roads plan no staggering of section gangs whatever; all the others will limit this practice to terminals or other selected locations. One road reports that section gangs can be staggered at definite locations between November 1 and March 31, the object apparently being to have men on duty on Saturdays to cope with storms.

A question relative to what restrictions, under the staggered arrangement, will govern the use of section gangs on territories other than their own, brought a variety of answers. Three roads said this was permissible in emergencies without restrictions; one indicated that its agreement with the union did not permit staggering at all; another said that section crews could be used on sections "adjoining and adjacent to their own"; still another said there were no restrictions in territories covered by agreement as to staggering; and one said there were no restrictions "provided the foreman on the section where work is to be done has obtained leave." On a road that is contemplating the use of floating "maintenance" gangs the matter of whether section gangs may be used on other sections is as yet unsettled, but it was indicated that the floating gangs could be worked anywhere on a division "if so assigned."

SUPPLIERS EXHIBIT



Texaco 904 grease—Texas Company. For lubrication of rail joints to reduce corrosion and joint wear, and to prevent joint freezing. Picture above shows condition of greased joint after five years of service on heavy-traffic main line. Original application by pump method without removal of joint bars.



Matisa automatic tie tamper—The Matisa Equipment Corp. Self-propelled, on-track machine made in Switzerland. Equipped with 16 tamping bars which constantly vibrate through each tamping cycle. Over compaction prevented by a torque-limiting device. All operations are controlled by one man.

Jackson Multiple Tamper—Electric Tamper & Equipment Co. A track-mounted, self-propelled multiple tamping machine employing 12 individual, electric vibratory tampers arranged to operate in unison and controlled by one man. Performs eight-point tamping of each tie.

40-Hr. Week

The short week has made necessary a careful "sighting" of maintenance policies

On seven roads definite plans are afoot or have already been carried out for lengthening track sections. On one of these the number of section and yard gangs was reduced from 954 to 787 on June 1, another has already lengthened its sections, and a third plans to eliminate 120 sections out of a total of 770, the explanation being that this has been made necessary by the altered relationship between expenses and earnings, and that excellent track conditions have made the step possible. Starting next year another of the seven roads plans to lengthen some of its main-line sections from 12 to 18 mi., at the same time shifting much of the work normally done by section crews to small motorized floating gangs. A fifth road plans to lengthen sections where this seems justified by improved track conditions or where traffic has changed, and is also contemplating increased supervision and the creation of floating "maintenance" gangs, which will permit the lengthening of sections at other locations. The sixth road plans a set-up under which sections will be lengthened and "booster" gangs will take over part of the work now done by the section gangs. The seventh road has a plan under which sections will be lengthened to secure larger gangs, each working under a single foreman.

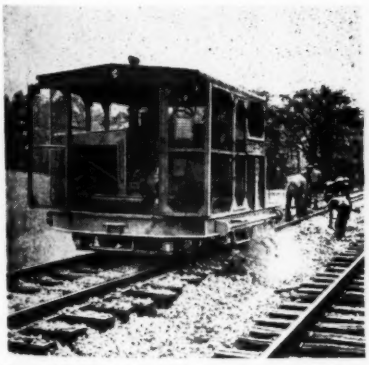
Only two of the 13 roads replying stated categorically that no lengthening of sections was contemplated. Four, using such expressions as "not at present" or "may consider later," implied that future events would be allowed to determine whether sections were to be lengthened.

The question of lengthening track sections was rather closely related to one inquiring in what ways the scope and character of section work would be changed under the new agreement. Seven of those replying indicated that no changes were planned, at least for the present. On the other six roads making replies the intention is to lighten the work of the section forces by transferring some of it to either conventional extra gangs or smaller floating gangs organized especially for this purpose, although one of these roads hopes to put its section crews on a more efficient basis by the "greater use of automobiles, trucks and track motor cars."

The companies participating in the latest survey were practically unanimous in replying "no" to a question as to whether, if the forces were rained out any time, Monday through Friday, they could be worked on Saturday to the limit of 40 hr. without overtime. There was only one possible rift in this solid array of negative answers, and that was the reply of one road which said

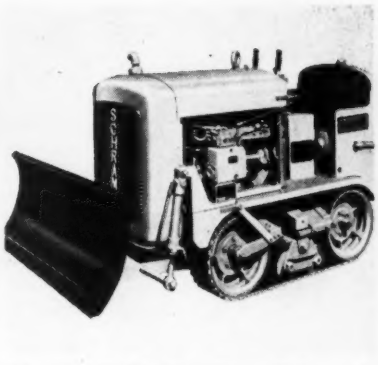
For additional information on any of the products exhibited on these pages, use postcards, page 835.

PRODUCTION AIDS



Power Ballaster—Power Ballaster Division, Pullman-Standard Car Manufacturing Co. A self-propelled machine with a 6200-lb. drop-head which imparts a pile-driver action to 8 tamping shoes. Equipped with two forks on each side which automatically feed ballast to tampers. Machine is operated by one man.

Le Roi 105 Tractair—Le Roi Company. Photo shows this combination tractor and compressor operating an air-driven auger suspended from a utility boom mounted on the rear of the Tractair. With this device holes can be bored horizontally, diagonally or vertically.



Schramm Model 60 self-propelled crawler air compressor—Schramm, Inc. A 60-cu. ft. air compressor plus a small tractor and power unit. Available attachments include hydraulic, backfill blade, winch and power take-off. Has electric starter, four speeds ahead and one backward.

there was a "possibility," which "will be developed later."

Two of the questions brought answers that indicate complete uniformity of practice. Every road answered "yes" to the question: "Do you plan to put extra gangs on a straight five-day week?" and all of them replied "no" to the query: "Will extra-gang labor be allowed to work four 10-hr. days to accumulate 40 hr. in less than five days, without overtime?"

Seven of the roads replying to the questionnaire are planning to make greater use of extra gangs. Among these are the three roads that have plans for establishing small floating gangs, variously termed "maintenance," "booster" or "bucket" gangs. Apparently the reasoning is that such gangs, motorized and highly mechanized, will be able to do the work more economically than conventional section gangs. Of the other six lines replying, three hedged somewhat on the matter of making greater use of extra gangs, saying that they had no such plans "at present." Two, however, answered with a definite "no", and one of the latter stated that it is planned to accomplish as much work in five days as was formerly done in six. The thirteenth road plans to use extra gangs on an increased scale only as needed to do authorized work.

The replies were practically unanimous in indicating that the bridge and building and water service forces will work a straight 5-day, 40-hr. week, with staggering of these forces planned only at some terminals on a few roads. On one road, which apparently had made a better "deal" with the union than the others, the water service forces will be available for emergency work on the sixth day without penalty. On another road, while the bridge and building and water service forces will be assigned to work a straight five-day week, there is hope of negotiating an agreement which will permit these forces to work more days in a week for the purpose of accumulating their days off. "It seems practical," read this reply, "from both the standpoint of the employes and the company to work a six-day week for say a period of five weeks, accumulating a full week off. This would simplify the matter of providing relief employes and should be desirable from the employes' standpoint in instances where he may be living in a camp a considerable distance from home."

Use of Relief Men

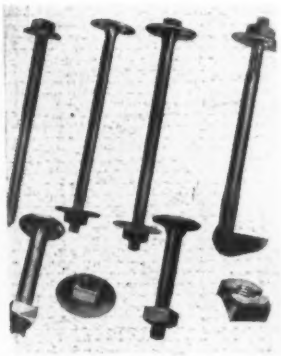
On nearly all of the roads replying relief men will be used in greater or less degree to help cover six and seven-day assignments. One road, while planning to use relief men where necessary, intends in most cases to use section laborers or bridgemen to cover six or seven-day assignments. It was explained that section laborers can be used for this purpose on most jobs, except that bridgemen must be used as bridge tenders. Most of the replies indicated that provision has been made for the use of relief men with composite assignments, although two stated definitely that no such provision has been made, and a third said that this matter had not been entirely worked out yet. Explaining the use of composite relief men, one reply said that trackmen will work as crossing watchmen, crossing watchmen will serve as bridge tenders, and plumbers will act as bridge engineers.

Accumulating Time Off

Only three roads, and possibly a fourth, indicated that provision has been made for accumulating time off on a monthly basis. On one of these roads the agreement provides that, where an operational problem arises wherein it is not possible to allow two days off in seven, rest days may be accumulated. On another it is permissible under certain conditions to work men five weeks (apparently of six days) and then having them lay off a full week. Another road simply stated that the accumulation of time off monthly was permissible only for relief men at certain locations.

Replying to a question regarding the working schedules of roadmasters and supervisors, six roads indicated that these supervisory officers will continue to work six days a week on pretty much the same basis as previously. On four roads it is planned that roadmasters will work a five-day week on a basis whereby Saturday will be comparable to what Sunday is at present. On another road the roadmasters will be staggered "to cover Saturdays and Sundays as at present," while on still another roadmasters will work five days and track supervisors six days on a "service-rendered basis, with adjustment in salary." The question of working schedules for roadmasters was reported as being undecided on one

SUPPLIERS EXHIBIT



Sealtite products — Lewis Bolt & Nut Co. Includes bolts with fins under the heads, car and running board bolts with fully braced thin heads, washer-head bolts, washer nuts, and vibration-proof Locktite nuts.

Burro Crane—Cullen-Friestedt Co. A self-propelled gasoline-powered on-track unit. Can be used with hook, tongs, clamshell, dragline, magnet, pile-driving equipment, etc. Travel speed from 1.25 to 22 m.p.h.

Adjustable rail holder—Morrison Railway Supply Corp. A device designed to absorb lateral forces exerted on rails in curved track and turnouts, thereby reducing lateral pressure against the track spikes.

Duff-Norton Model 517-B jack—Duff-Norton Manufacturing Company. For lining, surfacing and tamping. Has a bale-type handle and a 2½-in. by 3-in. toe. Height of jack, 11 in.; capacity, 15 tons; raise, 5 in.

line. On those roads where roadmasters and supervisors are to be on the job on Saturday, their duties on that day are variously described as "clerical work and riding trains," "working and planning ahead," "the same as at present so far as is known," and "for service as required."

Changes in Supervisors

Eleven of the replies indicated that no changes are contemplated in the number of roadmasters or supervisors, although several of these contained the qualifying phrase "for the present." One of the 11 expressed the opinion that some additional supervisors may prove economical by eliminating the patrolling of track by section foremen, and by providing closer supervision of the track forces. Of the other two roads one is "putting on about 45 new positions of machine supervisors, who will cover the territory more frequently and effect more intensive supervision over section and maintenance gangs." The other expects to increase the number of roadmasters by 50 per cent, shortening each roadmaster's district from 190 mi. to 130 mi. This measure, involving only 11 additional roadmasters, is expected to result in a saving in labor of about 150 track men.

Two railroads stated that their will be no track inspection on Saturdays; three others said their present methods of track inspection on that day would not be affected; three more said that this function would be handled on Saturday in the same manner as now performed on Sunday; another three said the Saturday inspection would be performed by the supervisory forces; and one said that patrol crews would work on Saturday. One road failed to indicate its plans in this regard.

Increased Mechanization

Practically every one of the replies stated that the 40-hr. week would result in increased purchases of power tools and machines, although one said this would not be the case except where the increased cost of labor would warrant the use of more equipment, while another, saying that larger purchases would "probably" result, added that work equipment had been bought heavily in recent years.

Four roads gave specific answers to a question relative to the magnitude for the increase expected. Three of these were in the 20-25-per cent range, but one road stated it expects to buy at least 200 per cent more equipment. Several stated that the extent of the increased purchases would depend on earnings.

What types of machines do the railroads anticipate purchasing? Listed most frequently in the answers to this question were power tamping units and all types of power tools for the bridge and building forces, with power plants. However, a great variety of other types of equipment was also listed, such as spike pullers and spike drivers, rail saws and drills, small air compressors for spot tamping, track cribbers, road rollers, crawler tractors, trucks, mowing machines, earth-moving equipment, material-handling cranes, off-track equipment, and many others.

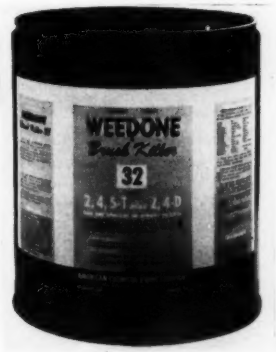
Practically all those replying to the questionnaire stated that the operating department can help to increase the efficiency of the maintenance forces, largely by taking action that will minimize interruptions to the work by passing trains. The chorus of the replies was that this can be done by allowing more liberal use of the tracks and by bunching or fleeting trains. Other ways in which the operating department can cooperate, according to the answers, include the elimination of delays in the delivery of materials and equipment and in assigning train crews where needed with roadway machines, furnishing proper equipment for delivery of materials in order to reduce unloading time to the minimum, and furnishing motor-car line-ups promptly to enable maintenance forces to get to work.

All except two of the roads submitting replies reported that they had signed agreements with the local brotherhoods covering all points of the 40-hr. week, although one of these said that a single point remained open. Ten said that they had not found it necessary to refer points in dispute to the 40-Hr. Week Committee, although one of these expects that there will be some arbitrary contesting of action taken by the railroad after September 1. The other three said that points involving deviation from the Monday-through-Friday work week had come up for adjudication.

For additional information on any of the products exhibited on these pages, use postcards, page 835.

LABOR SAVERS

Fence stretcher—Benbow Fence Tightener Co. When placed on a strand of loose fence wire and twisted by a wrench, this device winds up the slack in the fence wire until loose wire is as tight as desired.



Weedone Brush Killer 32—The American Chemical Paint Company. A non-toxic, non-flammable mixture of 2,4-D and 2,4,5-T which is reported to destroy more than 85 kinds of woody plants as well as weeds.

Track jack—Templeton, Kenly & Company. Simplex A5 with aluminum alloy housing. For tamping, lining, surfacing. Toe size, 2½ in. by 3¼ in.; height, 11 in.; weight, 28 lb.; lift, 5 in.; capacity, 15 tons.

HD-5 tractor equipped with Gar Wood dozer clearing spur-track shoulder — Allis-Chalmers Manufacturing Company. Other attachments for this tractor include front-end shovels, scrapers and winches.

The Rail Train Committee of the Pennsylvania (right side of table) has a 3:45 a.m. breakfast with the rail-train crew. Right to left, in order, are: J. S. Snyder, div. engr.; C. E. Gipe, div. engr.; W. W. Boyer, engr. m. of w.; I. A. Golab, track supvr.; J. W. Warbritton, clerk; and F. H. Rothe, asst. engr.

Who Says—"Nothing

Roving reporter spends busy day with special Rail Train Committee of the Western Region of the Pennsylvania, observing mechanized rail-laying operations on the Western Region. Sees many things, new or interesting, to increase the efficiency, safety and well being of the rail-laying forces, including tie-plate pickers to simplify removal of the old plates; tie-plate tongs for replacing plates; a rail swab for lubricating rail ends; a bolt grease dip and wiper; molded, plastic goggles; and not the least —the Rail Train Committee itself.

By "ON-THE-JOB JOE"
Special-Assignment Editor

Highway trucks transport the men to and from points of work. Here the equipment operators get an early (4:15 a.m.) start

• Today, which began with breakfast on the rail train of the Western region of the Pennsylvania at 3:45 a.m., in company with about 100 trackmen, an engineer maintenance of way, a couple of division engineers, a supervisor of track, and the region officer in charge of work equipment, I have seen rail laying at its best. No speed records were sought and none were broken, but equipment and gang organization were at top efficiency; timing and execution made the most of a tight traffic situation; and there were at least a few practices or innovations which add measurably to the already far advanced art of rail renewal. And what I saw may be considered only one-fourth the story, for there are four such rail-train organizations on the Pennsylvania, each geared to do a good job in an efficient manner.

Outstanding among the "new things" observed today is the Rail Train Committee of the Western region, which was in "double-quick" action throughout the day—and it was a long day—seeking in its monthly inspection ways and means of improving the efficiency, safety and comfort of the rail-train organization in every way possible. Other innovations included one-man rolling out of the old rail with a safety rail fork; the use of a special preservative to swab the newly-adzed tie-plate seats, which even when cold, does not precipitate a salt or sludge to clog supply tanks at distribution lines; tie-plate pickers to simplify removal of the old tie plates prior to

SUPPLIERS EXHIBIT

Teleweld process for building up rail ends—Teleweld, Inc. Process includes, in order, preheating of rail ends by a propane differential heater, welding with electric-arc equipment, postheating to temper weld metal, grinding weld to a true plane and a smooth surface, and, finally, slotting the joint.

Ditching on the C.B. & Q. with a Model LS-12 dragline—Link-Belt Speeder Corporation. Machine can be readily converted for use as crane, shovel, clamshell, pile driver or trench hoe. Company offers variety of crawler shovel-cranes, with capacities ranging from $\frac{3}{8}$ to 3 yd., adapted to maintenance work.

International TD-9 tractor—International Harvester Company. Equipped with a Hough hydraulically operated bucket, this crawler tractor leveled the 3,500 sq. yd. of the Burlington's Clarinda (Iowa), station area, covered it with cinders and compacted them in 24 hours. Other types of tractors available.

New in Rail Laying"?

adzing; new tie-plate tongs for replacing the tie plates on the newly-adzed plate seats; a one-man, two-brush rail swab for lubricating the webs and fillets of the new rail ends ahead of the application of the new joint bars; a bolt grease dip and wiper; and one-piece, molded plastic goggles. These, combined with power track wrenches, power spike pullers, power adzers, a pressure preservative spray, tie-plate gagers; a Burro crane for setting in the new rail, power bonding drills, rail joint-applying clamps, the Pennsylvania's power gaging machine, pneumatic spike drivers, and a Z-shaped rail-holding device used to simplify the cutting of closure rails, enable this rail-laying organization to change out rail with a high degree of skill, efficiency and safety.

But let's go back to the beginning. It is June 21. The cool, still-dark hours of the morning found your reporter and the Rail Train Committee (W. W. Boyer, engineer maintenance of way of the Southwestern general division; C. E. Gipe, division engineer of the Fort Wayne division; Frank Rothe, assistant engineer (work equipment on the Western region*), in company with J. S. Snyder, division engineer of the St. Louis division, and I. A. Golab, track supervisor, arriving at the rail-train, located on a siding about sixteen miles west of Terre Haute, Ind., on the Indianapolis-St. Louis line of the Pennsy.

Pulling up at 3:40 a.m. to the string of 39 outfit cars comprising the rail train, which were already stirring with activity, we headed straight for one of the four diners, where, with hardened, sun-tanned, experienced trackmen on both sides of the same table, we partook of the kind of a breakfast that makes a morning more than just the beginning of another day.

Rail laying was to start about three miles west of camp. Highway motor trucks, specially fitted with longitudinal seats, were ready. Equipment operators were the first to leave (4:15 a.m.), to uncover, lubricate and tune up the various rail laying machines, which had been left on a short spur immediately adjacent to the starting point of the day's work. The trackmen followed at 4:45 a.m., and were on the job at 5:00, just as the sun—a big red ball of fire—was peering over the low, wooded horizon.

But the actual start of the work, timed to complete the day's run ahead of a two-way fleet of passenger and freight trains showing up in this territory about noon, was not

(*Continued on page 866*)

*Another regular member of the committee—Stuart Dowling, clerk-labor agent, in the office of the chief engineer maintenance of way, Western region, and secretary of the committee—was prevented by other duties from making this inspection, and was represented by J. W. Warbritton, a clerk in the region office.

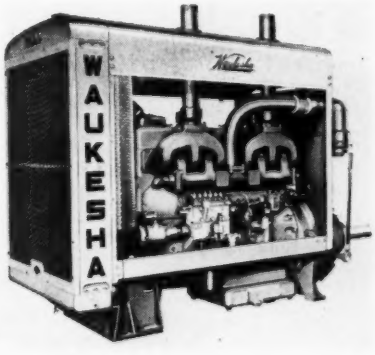
Above—The tie-plate pickers, which are merely shovel handles fitted with steel point, preclude a lot of stooping and back bending in removing the old plates. Below—These four-tine rakes are used to gather and pile the released track spikes, again saving much back bending

For additional information on any of the products exhibited on these pages, use postcards, page 835

IMPROVED PRODUCTS

Diesel D-4 Tractor with No. 40 Scraper—Caterpillar Tractor Co. Scraper is hydraulically controlled. Capacity 3.6 cu. yds., struck and 4½ cu. yd., heaped. Overall length 21 ft. ½ in. Width 7 ft. 5½ in. Cuts 6 ft. wide. Wheelbase 13 ft. 10 in. Turns non-stop in 19 ft. Shipping weight, 7380 lb.

Mule-Hide "Town and Country" Cor-Du-Roy shingles—The Lehon Company. These are heavy (290 lb. per square) four-unit shingles with a small (3⅞-in.) weather exposure said to permit lower nailing. Available in solid colors and blends of blue, red, green, brown and black. Triple thickness at exposed tabs.



Waukesha Diesel power unit—Waukesha Motor Company. A six-cylinder 6¼ by 6½, 1197-cu. in. engine rated at 152 hp. continuous with an overload capacity of 210 hp. Waukesha engines are employed in various types of railway equipment, including air compressors, weed burners, motor cars, etc.

to get started until 5:40 a.m., delayed by No. 33, which was running off schedule.

The work today was in single-track territory, where 131-lb. R.E. rail, with 36-in., 6-hole, toeless angle bars, was to be replaced with 133-lb. R. E. rail—with the same base width as the 131-lb. section, and to be joined up with the same general type of angle bars. All ties were to be adzed and all adzed surfaces swabbed with a preservative to provide new seats for the same—double-shoulder—tie plates, and each rail was to be anchored with six grip-type anchors in each direction, applied on alternate ties away from the joints. Rail-head signal bonds were to be used to close the track circuit. All this was well known to the rail-train crew in advance, which had already worked together for several months this year, and which was "raring to go," come No. 33.

Within three minutes after No. 33 passed, all of the major units of work equipment, which had been primed for action, were out on the main line, under "positive stop" protection. Five minutes later, with every workman in his assigned place, rails were being changed out at the rate of one a minute, under the watchful eye and planning of Floyd (Red) Sapp, general foreman of the rail train, several other foremen, and —not least—Division Engineer Snyder, Supervisor Golab, and the members of the Rail Train Committee.

Three times during the day, for periods of varying length, the rail-laying crew had to close up and clear the track for one or more trains, but each time, with the precision of a well-oiled machine, it went back to work and quickly struck its smooth-working stride. Within one of these periods, beginning about 9:30 a.m., while clearing for the westbound "Spirit of St. Louis," the men had lunch, brought out by truck in individual paper bags—and then went back at it again.

Tie-plate tongs do a nice job of replacing tie plates, saving a lot of stooping

One man uses the rail-end swabs and another man the bolt-grease dip and wiper

At 10:55 a.m., confronted by a fleet of trains headed by No. 65, final closure for the day was ordered, and the track was reported clear at 11:17. With 207 rails changed out, and the trucks ready, the gang started back for camp—leaving a good day's work behind.

A few words and the accompanying pictures will explain some of the newer "gadgets" and "tricks" in the rail train's "bag." "It can't be done," but it was most interesting to see one man, with a safety rail fork, working progressively at the advance end of each old rail, easily roll out the rail beyond the ends of the ties with three or four grabs, freeing a crane or several men with bars used under more usual procedure.

Then the tie-swabbing preservative used is something new to most roads, being a product which flows freely in cold weather, without heating, and which does not precipitate any salt or sludge in the reservoir or distribution system of the applicator. The tie-plate pickers are merely track shovel handles, each equipped with a metal point which is readily inserted in one of the tie-plate holes to raise and slide the plate from its old seat, with minimum stooping on the part of the workman.

The tie-plate tongs—constructed of relatively light, flat metal bar-material—resemble in essence tie tongs, except that for each of the points found on tie tongs, there is a pair of hook points, side by side, about two inches apart, which can be readily slipped under the plate to pick it up from any irregular position in the track. Thus, the cast-off plates are quickly replaced on the newly-adzed tie-plate seats, without stooping at any time.

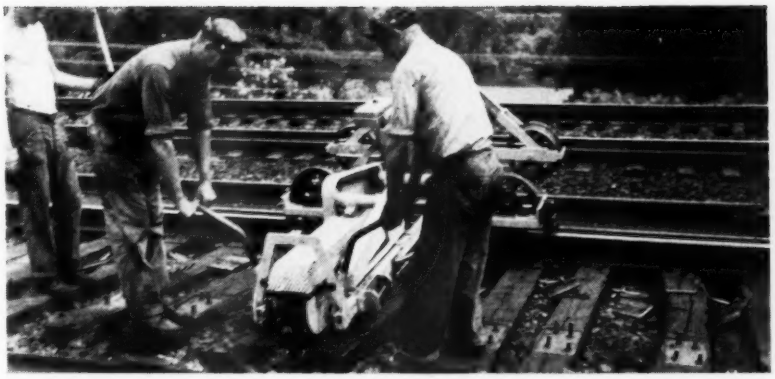
SUPPLIERS EXHIBIT

Thornley cribbing machine—Thornley Railway Machine Co. Designed to lower ballast in the tie cribs in connection with relaying rail. New Model "E" has flexible metal shielding, removable digging inserts, roller bearings and is said to be able to crib 40 ft. per min. Deposits ballast at end of tie.

Rail lubricator, Type MBJ — Maintenance Equipment Company. For lubricating rail and wheel flanges to reduce rail wear on curves. Pump actuated by a wheel-tread-operated ramp. Grease emerges from eight discharge ducts at top of each wiping bar. Bars are adjustable on gage face of rail.

Model "C" Raco Power Track Wrench—Railroad Accessories Corporation. This two-way tool is convertible from horizontal to vertical power for use in applying screw spikes and rail clips. Provided with Micro cut-out having a calibrated scale for controlling torque.

An electronic loudspeaker, with a warning range of ½ mi. in each direction



By means of steel teeth on an endless chain, the ballast extruder, working ahead of the adzers, lowers the ballast in the tie cribs, depositing it at ends of ties

The one-man, two-brush rail swab for lubricating the rail webs and fillets behind the new angle bars is, more accurately speaking, merely two separate fibre hand brushes—the brush heads, about two inches in diameter, projected at right angles to the ends of light wooden handles about 18 in. long. With one such brush in each hand, the workman, while straddling the rail in the direction of laying, can draw the oiled brushes back and forth along the webs and fillets within the bar area, until they are uniformly coated.

The bolt grease dip and wiper, used by a man who moves along with the employee lubricating the new rail ends, is merely an open-top can, the feature of which is a wiper at the top, attached to the inside rim of the can, to remove excess grease as the bolt thread area is withdrawn from the grease reservoir. This wiper is merely an inverted truncated cone, the hole in which is only slightly larger than the diameter of the bolt. Thus, the bolts not only center themselves in the hole readily for dipping, but the sides of the hole in the wiper free the threads of excess grease automatically as the bolts are withdrawn.

The one-piece plastic goggles referred to earlier are described by the name, except to say that they are molded into a ventilated hood, without metal frame, that completely encloses the eyes while affording maximum vision in all directions.

The tie-plate gagers, joint-applying clamps, and the Z-shaped rail-holding device used to simplify and increase the safety of cutting closure rails, making use of the rail crane to put a strain on the nicked rail, were all described in the March, 1943, issue of *Railway Engineering and Maintenance*. The power gaging machine being used on the Western region was described in detail in the November, 1948, issue.

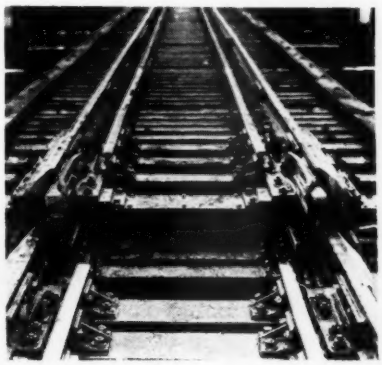
To mention these new or recent developments observed on this particular job is not to tell the entire story of new "gadgets" being tried out or used on the Pennsylvania to facilitate and improve rail laying, for I am told by the boys here that the other rail train organizations on the road have some innovations of their own. Among these are what is called an extruder, to lower the ballast in the tie cribs, on a flat plane, ahead of the adzers; a greaser, which is designed to spray a rust inhibitor and lubricant onto the new rail ends, joint bars and bolts; and an electronic loudspeaker, which, in the hands of a watchman near the center of the rail-laying operations, can warn the crew of approaching trains over a distance of one-half mile in each direction.

But more significant than all of these new devices and expedients to

For additional information on any of the products exhibited on these pages, use postcards, page 835

HELPFUL SERVICES

DiesElectric locomotive crane — American Hoist & Derrick Company. Diesel power to the deck. Electric power to the trucks. Tail swing only 11 ft. Full vision cab places operator at side of boom with view of load at all times. Finger-tip air controls. No king pin. Maximum capacity, 50-ft. boom, 50 tons.



Manganese mitered rail ends for movable bridges—Conley Frog and Switch Co. Said to be ruggedly designed to assure long life, smooth and safe operation. Can be provided in any rail size for swing, vertical-lift or bascule bridges. In service for 12 years on 40 bridges. Other track devices available.

Weed control service—Chipman Chemical Company, Inc. Includes spraying equipment and chemicals. Among these is a new weed killer, Chlorax spray powder designed for use at locations where the fire hazard is great, such as around oil and tie-storage yards, timber trestles and other wood structures.

Here comes the committee as it checks exterior and surroundings of the train. Left to right are: W. W. Boyer, Frank Rothe, G. E. Gipe, and J. W. Warbritton

the efficiency and safety of the rail-train organization, and relatively new even on the Pennsylvania, is the Rail Train Committee, which is really the "watch dog" of mechanized rail-laying operations on the Western region. This committee, which was organized early this year, includes in its permanent personnel, as already mentioned, the engineer maintenance of way of a general division, a division engineer, the region work-equipment officer, and a region office clerk (as secretary). Filling its assignment, one day each month is spent with the rail train (usually the third Tuesday) when every aspect of the rail-train organization is scrutinized, such as safety, the distribution of forces and equipment, standards followed, and the health and general well being of the men. Nothing is too small or insignificant to be given its attention.

The whole day is spent observing organization, equipment and practices, watching for inefficient details and safety violations, and in endeavoring to correct or improve conditions. Discussions are held with the local division engineer and supervisor, rail-train foremen and other foremen, and usually two meals are eaten with the men to observe the character and quality of the food served. Toward the end of the day, just before the men return to the camp, a detailed, inside and outside, car-by-car, inspection is made of the equipment and rolling stock.

A feature of the committee procedure is the fact that all of its observations, discussions and recommendations are made a matter of permanent record, the secretary keeping notes currently, which are incorporated into a final report made to the region's chief engineer maintenance of way. Thus, nothing is left to memory. Every item is given a specific number, and the first item of business on each succeeding inspection is the "unfinished business" on the previous report—or a follow-through until action has been taken on earlier observations.

Committee Passes Up Nothing

Today's inspection of the Rail Train Committee was no exception. All day long, everywhere along the line of operations, the committee was in action, its members observing or consulting individually or collectively. Throughout the working hours no less than 31 items from previous reports were checked on, including details of handling the new rail into track in the safest manner; gaging; spike driving; tie boring bits; organizational details to increase efficiency; meals; and a wide range of safety items covering the use of goggles, white flagging discs, canvas gloves, canvas aprons for the adzers, safety shoes, water containers and drinking dippers.

The latter part of the working hours was spent inspecting the camp, with its 13 sleepers, 4 diners, kitchen car, recreation car, 3 water tenders, tool car, laundry car, emergency machinery car, commissary car, generator car, grease car, and 11 flat cars for loading and moving the rail-laying equipment—before the men returned for the day. Just like a "headquarters inspection" in the army by the company commander, his top sergeant and superior officers, the members of the Rail Train Committee passed from car to car, inside and out, checking on previous observations, criticisms and recommendations, and looking for anything new needing attention.

In the June 21 inspection—as either old or new business—modernization and painting of some of the cars, bunk details, coal boxes, electric supply, electric refrigeration, water coolers for the diners, camp stools, kitchen details and menus, among other things, came in for attention. Even plans were made for an early "get-together" of all rail-train employees for a safety talk and movies—with watermelon refreshments . . . and all of the recommendations of the committee will be acted upon—with the approval of the regional chief engineer maintenance of way—because they are all in the written record, and will stay on the agenda until disposed of in one way or another.

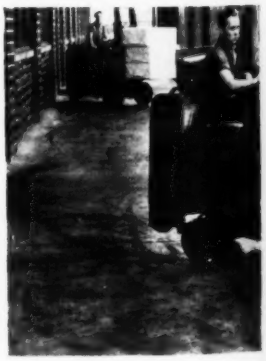
Who says there's nothing new in rail laying?

SUPPLIERS EXHIBIT

Prefabricated sectional grade crossings—The T. J. Moss Tie Company. Sections consist of creosoted timbers bolted together with ¾-in. bolts. Fastened to ties by lag screws. Section lengths, 4 to 8 ft.

Racine unit tamper — Racine Tool & Machine Co. Self-contained tie-tamping unit powered by a 2-cycle, air-cooled gasoline engine. Combines a stirring action with 1500 blows per min. Weighs 60 lb.

Safety-First shoes — Safety First Shoe Company. "Lace-to-Toe" Style 3978. Neo-Cord sole and heel, steel box toe. Available in sizes 5 to 12. Company offers wide range of other styles of safety shoes.



Floor resurfacer — The Stonhard Company. A material for repairing worn or rutted platforms and floors. Usual application ½ in. thick. Can be applied to wood, concrete, brick, or composition surfaces.

CONCRETE DURABILITY—

Why So Elusive?

By DR. RUTH D. TERZAGHI
Consultant, Research Staff
Engineering Division, Association of American Railroads
Winchester, Mass.

A typical example of pop-outs and cracking caused by excessive expansion of aggregate. Shale, weathered granites, and certain fine-grained limestone aggregates give such results

• Unequal volume changes undoubtedly take place in all concrete. If the inequalities are slight, they have no harmful effects. If, however, they are so great that the resulting stresses exceed the tensile strength of the paste, mortar, or concrete, the concrete will sooner or later present expensive maintenance problems.

Inspection of a large number of distressed concrete structures on railroads in different parts of the country has convinced me that excessive unequal volume changes in concrete constitute one of the major causes of concrete deterioration in these structures. Serious deterioration is particularly likely to take place if there is: (1) Excessive shrinkage of mortar due to drying; (2) excessive expansion of the aggregate due to wetting, to freezing of water in pores, or to reaction with constituents of the cement; or (3) deficient contraction of the aggregate in cold weather. The incidence of trouble due to some of these causes could be reduced considerably, even on small jobs, by careful examination of the aggregate and inspection during concreting. Other potential sources of trouble are likely to remain with us for some time, except on jobs which are large enough to justify the use of elaborate testing equipment.

Contraction of Mortar—Upon loss of moisture, every mortar shrinks more than normal aggregate, and mortar shrinks more than concrete. If the water content of the mix is held to a minimum, these differences do not exceed tolerable limits, but if the mix is very wet, the drying contraction of the paste, as well as of the mortar, is so much greater than that of the aggregate, that fissures inevitably form throughout the mass of the concrete. If the mix is so wet, so poorly designed, and/or so overworked during finishing that excessive bleeding and segregation of mortar results, cracking and scaling are certain to take place. Increased vigilance during mixing and placing operations constitutes the obvious preventive for this kind of trouble.

Excessive Expansion of Aggregate—Shale, and a few other rocks containing clay, such as altered or weathered granites, and certain fine-grained limestones, expand excessively when they have an opportunity to absorb water. If aggregate particles of such rocks are located close to an exposed surface of concrete,

This article was originally submitted as an answer to a question on the extent to which unequal volume changes in the constituents of concrete contribute to its deterioration, which was discussed in the July issue. Because of its scope and character it is presented here as a separate article.

For additional information on any of the products exhibited on these pages, use postcards, page 835.

SAFETY APPLIANCES

Aluminum track jack, No. A-1522-T — Joyce-Cridland Company. Capacity, 15 tons; rise, 13 in.; height, 22 in.; weight, 37 lb. Integral working parts made of nickel-chrome steel. Has reinforced striking pad.

Willson Monogoggle — Willson Products, Inc. A cup-type safety goggle with one-piece plastic lens, which may be worn either with or without prescription glasses. Available in curved or flat styles.

Barco Tytampers—Barco Manufacturing Co. A gasoline-driven, self-contained unit for tamping ties. Requires no cable, hose or other auxiliary equipment. Available in light and heavy-duty models.

Chemicals for weed control—Dow Chemical Company. Spraying a roadbed with a weed-killing formula. Company offers several chemicals that may be used for control of right-of-way weeds and brush.

they form popouts, and if they constitute as much as 10 or 15 per cent of the aggregate, severe spalling is likely to take place, even in a mild climate.

Shale, mudstone, and other fine-grained friable or soft rocks are readily identified by anyone who will take the trouble to examine aggregates carefully. Commonly it will be necessary to break the fragments with a hammer in order to obtain a fresh surface for examination. Because such rocks are almost certain to cause trouble, aggregate containing a conspicuous quantity of them should be avoided.

Fine-grained limestones are not always troublesome, and local experience will provide the best indication of the quality of such rock. Both course and fine-grained varieties of limestone may occur in a single quarry and it may be necessary to insist on wasting strata of fine-grained material if the condition of concrete structures in the locality indicates that the fine-grained varieties cause popouts.

Particles of certain other types of rock cause popouts because water which collects in cavities in them causes local expansion when it freezes. Porous chert is an outstanding example of this type of rock. It occurs in many limestones and is also found in some river gravels, for instance, in those dredged from the Ohio river. Many specimens of such chert are readily identified by their "wormeaten" appearance, but laboratory tests may be required to identify other deleterious cherts.*

Chert is composed of microcrystalline silica. In a fresh state it commonly has a waxy, vitreous, or resinous luster. Weathering may render it dull or earthly in appearance. Engineers generally apply the term chert to both light and dark-colored varieties of microcrystalline silica, whereas geologists reserve the term for the light-colored varieties, dark-colored ones being called flint. From the point of view of concrete technology, it is worth while to distinguish between the two, because, at least in some localities, flint is nonporous and makes durable aggregate, whereas chert is likely to contain the kinds of cavities which render it nondurable under freezing conditions.

Still other rock types expand when used as aggregate because of chemical reaction with the potash and soda contained in cement. Aggregate containing particles of these rocks is known as *reactive aggregate*. Common constituents of such aggregate include volcanic glass and non-crystalline silica, known as opal. Even an experienced petrographer would find it difficult to identify some types of reactive aggregate without recourse to a well-equipped laboratory. However, the staffs of several laboratories of government agencies are making a concentrated effort to develop simple tests for the identification of such aggregate, and considerable progress has been made. One of the most promising methods of testing has been described by D. O. Woolf and Theodore Smith ("A rapid method of testing materials for the alkali-aggregate reaction," Symposium on Methods and Procedures for Identifying Materials in Concrete, A.S.T.M., 1948). Any engineer who is responsible for the purchase of aggregate in regions infested by reactive aggregate would do well to make this test a routine procedure. Testing is particularly necessary in regions where it is impossible to obtain cement containing less than 0.6 per cent total alkali ($Na_2O + 0.658\ K_2O$).

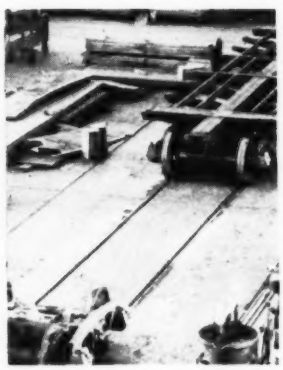
Deficient Contraction of Aggregate—Many rocks contract less upon cooling than the cement paste or the mortar. If the difference between the thermal contraction of an aggregate particle and that of the surrounding paste or mortar is excessive, the aggregate particle becomes so much too large for its socket that cracks develop in the surrounding paste or mortar. If the concrete containing such cracks is continuously saturated with water during freezing weather, severe deterioration may take place in a single winter. If the concrete is not saturated, or if the difference in thermal expansion is less extreme, deterioration is slow. Some limestones and marbles and possibly some basalts have such a low coefficient of thermal contraction that concrete containing them is not durable. Because such rocks cannot be identified without rather elaborate equipment and trained personnel, a bad service record is likely to constitute the only available indication that they should be avoided. It would, of course, be entirely unjustifiable to avoid limestone aggregate on general principle, because most make good aggregate.

*For description of simple testing techniques, consult the following: W. E. Wuerpel and E. P. Rexford, "The Soundness of Chert as Measured by Bulk Specific Gravity and Absorption," *Proceedings*, Am. Soc. Testing Materials, Vol. 40, p. 1021 (1940). H. S. Sweet and K. B. Woods, "A study of Chert, as a Deleterious Constituent in Aggregates," Purdue University *Engineering Bulletin*, Vol. 26, No. 5, 1942. Details of the techniques developed by these authors might require modification in other regions.

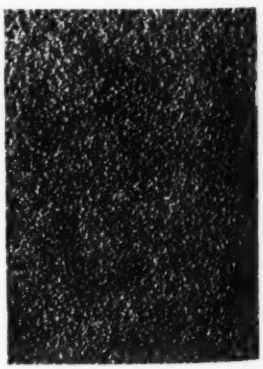
SUPPLIERS EXHIBIT

Portable sanitary drinking fountain—Dobbins Manufacturing Co. Operates like any bubbler drinking fountain at press of a button. Equipped with air pump. Inner tank of stainless steel, insulated.

D Roadster Tournapull—R. G. LeTourneau, Inc. A self-loading dirt mover equipped with electric control, positive steering and four-wheel air brakes. Travels at speeds up to 25 m.p.h. Capacity, 7 yards.



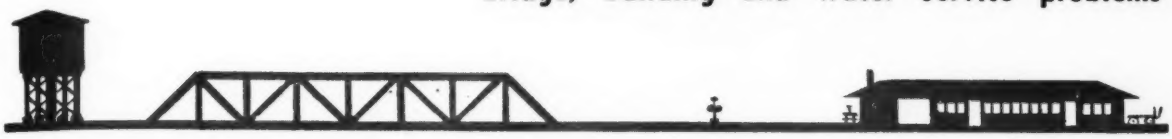
Masterplate metallic concrete floor — The Master Builders Co. A surfacing material of cement-welded iron particles. Can be used as a topping for new floors or for resurfacing. Available in standard colors.



Stainless steel blast plates —The Carnegie-Illinois Steel Corp. Showing condition of a test specimen after seven years of service on a heavy-traffic bridge. Average loss of thickness only 0.006 in.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Track Inspection Recorders

What are the advantages of using recording machines in making periodic track inspections? How can the records obtained be used to the best advantage? Explain.

Have Been Great Help

By P. O. FERRIS

Chief Engineer, Delaware & Hudson, Albany, N. Y.

We use, generally in the spring and fall, a recording machine of the portable type, which we set on a rugged stool placed on the floor of a business car over the center of the rear trucks. The use of this machine has many advantages. It provides a complete record of track conditions for system officials who do not have an opportunity to make track inspections as frequently as do division officers. Both spring and fall inspections are made by the chief engineer, accompanied by division engineers, over the entire system. The local supervisors also accompany the inspection trip over their respective territories. One of its greatest advantages is the effect it has on the morale of supervisors and track foremen. Another advantage is that a track recorder often indicates conditions not always visible to the eye. These advantages lead to more uniform standards of track maintenance.

Such inspections, together with the resulting tapes printed by the recorder, bring out conclusively the weaknesses that require treatment. When a study of the tapes recorded on prior inspections shows chronic weaknesses, it indicates that a study should be made to effect a cure rather than to repeat the correction.

After the tapes are reviewed by the division staff, they are cut and distributed to the foremen. We have found that this method has stimulated the foremen in correcting irregularities, particularly poor line and surface conditions, on their sections.

On every inspection trip, tapes of prior inspection trips are available

(*Continued on page* 872)

To Be Answered In the November Issue

1. What effect does mill tolerance, end batter and other irregularities in rail-end surface have on joint maintenance? Would the maintenance of good line and surface be affected appreciably if such irregularities were ***entirely*** *eliminated? Explain.*

2. Can the exteriors of buildings be painted during the winter? Under what circumstances? What precautions should be taken to assure the best quality of work? Explain.

3. What is a motor-car indicator? What is its function? Under what circumstances can such indicators be used to good advantage? Explain.

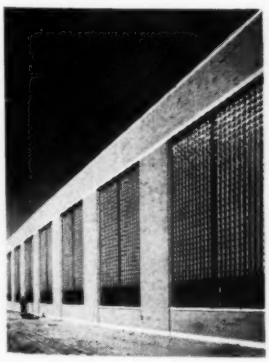
4. During the mixing and placing of concrete on small jobs, who should exercise the vigilance required to insure the highest quality of finished product? What special precautions should be taken?

5. Where can heaving track be expected during the winter months? When preparing for winter, what, if any, special precautions should be taken at these points? Explain.

6. In what ways can water service forces help to insure the safe and efficient operation of steam heating boilers in railway buildings? Explain.

7. What methods are most effective in cleaning marble in station concourses, waiting rooms and washrooms? How can stains be removed? Explain.

VERSATILE MACHINES



Insulux glass block—Owens-Illinois Glass Company. Hollow, hermetically-sealed units used in building construction to daylight interiors. Laid in a manner similar to brick. Has a high insulation value.

Blue Brute Hand-I-Air compressor operating WTT-7 tie tampers — Worthington Pump and Machinery Corp. Compressor output, 60 cu. ft. per min. Drives all types of air tools. Operates four WTT-7 tampers.

Koehring 205 Railaid — The Koehring Company. A crawler crane that can be mounted on a special propulsion car for on-track work. Track speeds up to 14 m.p.h. Crane capacity, 7 tons; shovel, ½ yd.

Diesel-electric locomotive crane —Industrial Brownhoist Corp. Capacities of 30 tons and up. Cab offers 360-deg. visibility. Self-propelled, moves at speeds up to 15 m.p.h. Doubles as a switch engine.

for comparison with the one being made. This indicates at once whether or not bad conditions have been corrected. They also provide information as to the degree or quality of corrective measures taken to overcome irregularities of surface and line. For example, a comparison of tapes before and after a surfacing and lining project indicates how effective the work has been.

The spring inspection indicates the work that should be done immediately, after coming out of the winter, and that which can be programmed for the summer working season. The fall inspection spot lights the places at which work is necessary before going into the winter season.

All our forces are much impressed with the work of the recording machine and we have used it for several years to great advantage.

Timber Connectors For Buildings

What are the advantages of timber connectors in railway building construction? Are there disadvantages? Under what circumstances is their use indicated?

Aid Better Wood Use

By H. M. Church
Church Inspection Service, Richmond, Va.

Timber connectors, as used in the construction and design of railway buildings and structures, have many advantages. The principal advantage in the use of connectors, such as split rings, claw plates, and spike grids, is that the load is more uniformly distributed in a splice or a joint than it is with a bolt alone, and hence a more efficient bearing is provided against the wood. Straps with shearplates have recently been used effectively in tunnel lining and mine timber installations. Joist and framing anchors develop maximum shear and tension without splitting the wood, and at the same time provide increased rigidity.

Acceptable wood utilization data for heavy timber construction in buildings comply fully with building codes recommended by the National Board of Fire Underwriters and alternate framing details provide simplified methods for using connectors for floorbeam, roof-truss, and column assemblies.

The natural efficacy of wood in such jointed members enables and promotes greater utilization of lumber in that the ratio between the member and the connectors allows the use of a lower stress-grade-timber in general designs, so as to be more consistent to a minimum design dimension that may be suitable and applicable for the member.

In structures where corrosion is a matter of concern, such as enginehouses, open-deck railway bridges, and highway bridge floors, metal fastenings may be more completely embedded so that the use of galvanized hardware may be reduced to a minimum. Here again, greater effectiveness and utilization of timber is permitted. In addition, there are interesting developments in assemblies of lag screws, drive dowels, washer head spikes, where the joint assembly may be made with malleable iron in cast-iron grids—square and circular.

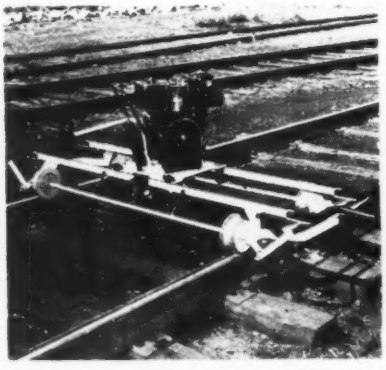
Make Clear Spans Possible

By Harry A. Uhl
President, Timber Engineering Company, Washington, D. C.

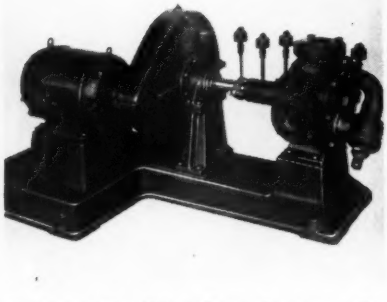
The principal advantages in the use of timber connectors in railway building construction are the efficiency and economy of the structural connections between the timbers.

In explaining the advantages of a timber connector, its purpose and action should be analyzed and then compared with other methods. The basic purpose of any fastener is to resist and transmit stresses efficiently from one structural member to another. Its action is one of spreading the load over a large area of the wood members. It is evident that the stresses at the adjacent faces of two adjoining members will be the highest. In other words, the wood fibers at these surfaces, if loaded to capactly, would be acting at 100 per cent efficiency, while the fibers at the center would use only a small portion of their capacity. It should be pointed out that the section of the bolt in the middle one-half to two-thirds of the member is very inefficient because the removal of the wood required for the bolt has a weakening effect.

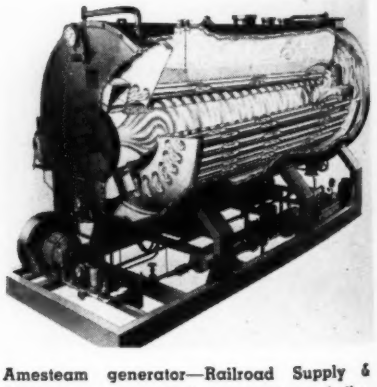
SUPPLIERS EXHIBIT



Rail joint cross grinder, Model P-11-S—Railway Track-work Co. Its gasoline engine and grinding equipment are mounted on a combination carriage and turntable so that grinder can be moved from rail to rail and also turned through 360 deg. The steel frame is mounted on four flanged wheels.



Oil Pump—The Viking Pump Company. For handling of gasoline or Diesel fuel oil. The pump, along with its gearing and motor, is totally enclosed, permitting outdoor operation without protection. Available with valve on pump head to prevent damage when discharge line is closed. Viking Model Q-162.



Amesteam generator—Railroad Supply & Equipment, Inc. Said to need no boiler-room labor, and no chimney draft. Emits neither smoke nor soot. Guaranteed to have thermal efficiency greater than 80 per cent. Boiler capacities, 10 hp. to 400 hp. at 15 to 200 lb. pressures.

Modern connectors, by acting in the plane of maximum efficiency (while removing only a small portion of the wood in the adjoining members), and by providing twice the bearing area for the same diameter or width, provide a very efficient and economical type of mechanical connection in timber.

As an example of the economy of the connector joint over a bolted joint in a tension splice designed to carry 22,500 lb., four 4-in. diameter split rings with two ¾-in. by 9-in. bolts are required, whereas eight ¾-in. by 9-in. bolts are required without the use of connectors. In this typical joint the hardware cost is 62 per cent more for the bolted joint using the same size wood members. Before the advent of connectors, timber trusses were heavy and cumbersome, having members much larger than were required for the stress they carried, but the design of the joints necessitated these large sizes. Timber connectors not only save hardware but reduce the amount of timber used because the timber is utilized more effectively.

There are many types of railway buildings where timber trusses have been used with considerable saving, and at the same time their use has increased the utility of the buildings. Through the use of clear-span trusses, unobstructed floor areas have been provided in enginehouses, warehouses, shops of almost every kind, freight transfer platforms and storage buildings. The mechanized tractors of all kinds used in present-day freight-handling facilities demand larger unobstructed floor areas for their efficient operation, because columns or other obstructions reduce their mobility and consequently slow down handling operations and increase costs.

The principal disadvantage in the use of connectors is the reluctance of workmen to abandon old methods for a new and different method. Ordinarily, however, once the workmen have tried connector construction, they like it, as the advantages to their completed work are apparent. Another matter that is sometimes a disadvantage is in the use of treated members. The members should be grooved before treatment rather than after.

The American railroads are one of the four largest users of lumber and forest products. Railroad engineers have always been alert to the economies inherent to timber construction for building and way structures. Now, as always, they are interested in the improvements that have been made to assure permanent and economical timber structures. Modern timber connectors provide a means to this end.

Calling Track Foremen to Phone

Should visual or audible means of communication be provided at outlying switches in C.T.C. territory to permit the C.T.C. operator to direct the track forces in the area to communicate with him? If so, what type of communication signals should be used? What are the advantages of such communication?

Buzzer Horns Save Time

By C. W. Reeve
Division Engineer, Delaware & Hudson, Plattsburgh, N.Y.

For the efficient operation of outlying switches in C.T.C. territory some means of communication should be provided to direct anyone working in the vicinity to communicate with the C.T.C. operator. A very effective method is to mount, on the outside of the C.T.C. cabin, a buzzer horn which is connected into the C.T.C. telephone circuit. This horn can be blown by the C.T.C. operator whenever he wishes to contact anyone in the vicinity of the switches.

Such a communication system is particularly helpful in cases of emergency. If the C.T.C. operator has any difficulty in throwing a switch during severe snow storms, the condition can be quickly corrected. In the event of a derailment such a call system will save valuable time.

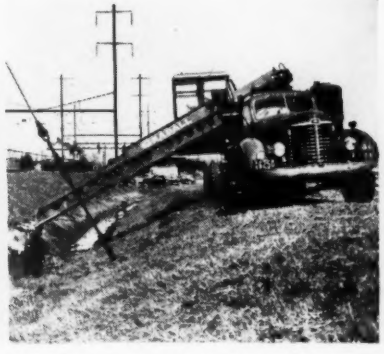
There are other advantages in having a system whereby the C.T.C. operator can let the track forces know that he wishes to communicate with them. Such a system is helpful in more efficient train dispatching. When train delays occur in the vicin-

For additional information on any of the products exhibited on these pages, use postcards, page 835.

MATERIAL MOVERS

Nordberg Ballastex-Screenex—Nordberg Manufacturing Co. Two machines combined. Ballastex excavates ballast in intertrack or shoulder. Screenex cleans it on Nordberg-made Symons Rod Deck screen, returns ballast to track and wastes dirt. See page 886 for complete description of the Screenex.

Haiss-Universal portable car unloaders and conveyors—Pettibone Mulliken Corporation. As adapted to the stock-piling of coal, a system of two unloaders, two portable conveyors, a horizontal Conveyor and a stacking Conveyor unload two hopper bottom cars simultaneously.



Gradall multi-purpose earth mover — The Warner & Swasey Company. Basically a mobile combination of interchangeable tools operated entirely by hydraulic power. Welded boom moves in and out, up and down, tilts 45 deg. each way, and the turntable swings 360 deg. Moves at truck speeds.

ity of C.T.C. cabins, the operator can let a train service man know that he wishes to talk with a member of the train crew. When signal department employees are in the vicinity working on switches, the operator can determine very quickly the progress of the work by means of the communicating system.

Lights Are Effective

By A. G. Reese

District Maintenance Engineer, Chicago, Burlington & Quincy, Galesburg, Ill.

It is imperative that some means of communication be provided to facilitate the sending of track forces in centralized traffic control territory to locations where trouble exists. The expense of installing and maintaining amplifiers or loud speakers at outlying switches cannot be justified in general, since a telephone connected with the dispatcher's wire is always located adjacent to the switch. However, in congested areas, a siren or horn can be installed to call signal or track forces to the nearest telephone.

At outlying switches the usual installation, which has proved to be efficient, is a white lamp mounted on the building housing the necessary relay cases, etc., at each switch location. When lighted, this lamp is a call for the signal and track forces to communicate by telephone with the dispatcher at once for information or instructions. Since portable phones are generally furnished to signal and track forces, it is often possible to communicate with the dispatcher from the site of the work and avoid delay incident to traveling to the telephone installed at the nearest switch.

Operating conditions, heavy traffic, and generally-high speeds in C.T.C. territory make it essential to provide means of communication to mobilize track forces in case of an emergency if costly delays are to be avoided.

Features of Portable Buildings

What are the essential structural and sanitary features of portable buildings for housing track and bridge and building forces moved periodically from place to place?

Must Be Salvageable

By Assistant Engineer Buildings

The essential sanitary features of portable buildings for housing employees are no different than those for any other type of building used for the same purpose. There can be no relaxing of sanitation standards merely because such buildings are classed as portable. They still must be constructed, operated and maintained so as to provide the basic requirements of healthy living conditions for the occupants and not endanger the health of the public.

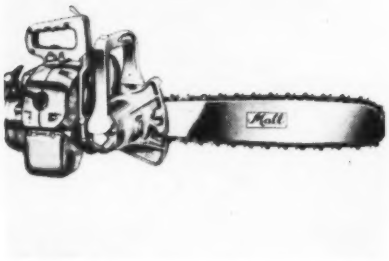
Some of these basic requirements include a space allowance of 50 sq. ft. per man in bunk quarters, window openings of at least 12 per cent of the floor area, and ventilators for bunks not adjacent to windows. Sufficient hot water should be provided to serve at least one wash basin for every three persons and a shower bath for every 10 men. In the mechanics of meeting this requirement portable buildings will generally differ from the permanent type in that these facilities will be in building units separated from sleeping quarters. Facilities for dispensing bacteriologically pure drinking water must be provided, but not necessarily in each unit. Finally toilet facilities must meet the requirements of state health departments. Generally this can be accomplished by chemical toilets placed in groups in one of the portable units.

The first structural requirement of portable buildings for housing men is that the units be salvageable for use at other locations. This can be accomplished by designing them so they can be dismantled and reassembled, or moved as a unit without dismantling.

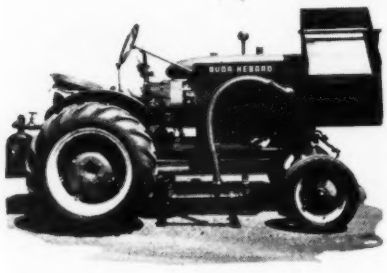
These buildings can be fabricated of various materials, including T. & G. siding, weatherproof plywood, wallboard, and steel of several types. It is generally agreed that the steel buildings will submit to more dismantling and moving than the other materials. Wood buildings can be made more durable in this respect if their component parts are fastened together with bolts rather than nails.

To be portable, yet serve in the housing of men, these buildings must be constructed in basic-unit sizes.

SUPPLIERS EXHIBIT



Mall Model 12 gasoline-engine one-man chain saw—Mall Tool Company. Equipped with two-cycle engine, ball and needle bearings throughout, rewind starter, and one-piece alloy-steel guide plate. Clutch control in auxiliary handle. Chain and guide removable. Also available with bow saw attachment.



Hebard grouter—The Buda Company. This is a self-contained unit for pumping water from source, mixing the grout, forcing it through points by means of a double acting hydraulically operated pump. Whole unit is mounted on a rubber-tired tractor for off-track mobility. Travel speeds up to 10 m.p.h.

Snow loader and melter—Barber-Greene Company. For clearing yards, terminals and team tracks. Has a capacity of 30 cu. yd. per min. and a 12,000 gal. melting tank. Propelled by a locomotive which also furnishes steam for melting tank. Loads snow from width of 9-13 ft. Welded construction.

Most of these units have a standard width, say 20 ft., but a length that varies in multiples of the unit length, often 8 ft. Thus, a building may be 20 ft. by 8 ft., 16 ft., 24 ft., etc. With all floor, sidewall, endwall and roof sections of these buildings interchangeable, the arrangement of units is sufficiently flexible to accommodate most railroad housing requirements.

The main disadvantage of this type of building, structurally, is that few of them meet existing building or fire codes. Where these codes must be met, a search must be made for a specific type that meets these minimum requirements.

Preboring Bridge Ties for Spikes

Should bridge and trestle ties be prebored for spike holes prior to being given preservative treatment? What are the advantages of such practice? Are there other means of obtaining the same ends? Explain.

Prebore When Sure of Fit

By George S. Crites
Division Engineer (Retired) Baltimore & Ohio, Baltimore, Md.

The standardization of tie plates and spiking for fastening rails to bridge and trestle ties has made it possible to prebore holes accurately and satisfactorily in the ties for many structures prior to giving them preservative treatment. Such preboring makes the application of rails and fastenings rapid, secure and lasting. There need be no trial puncturing of the treated ties in getting the rail and plates into their proper places, and the hold-down devices, be they cut spikes, screws, hooks or other devices, will be secure in their pretreated holes. Wood fibers are not mutilated and channels are not made for water to enter the ties.

This applies particularly to the decks for new structures and to decks of old structures on tangents. For the average old structure on curves, for which there may not be accurate framing diagrams of correct and up-to-date alinement, the timber may be mutilated and time lost in an endeavor to prebore ties. Usually, it would take more engineering and drafting to get out boring plans for such a structure than is available. Undoubtedly, the best practice for such a structure is to preframe the ties before treatment, so as to fit the members of the structure and aline the rail and bearings in their desired places before fastening them down.

If this is done, it is essential that the spike holes bored in the field be filled with preservative before the final fastening down takes place. Any trial holes that may have been made should be treated and plugged with treated plugs. If time is not the deciding element, there should be little or no such patching to do.

Boiled down, the answer seems to be to prebore for spike holes before treatment when there is absolute certainty of results, but to bore and treat the holes after the ties are in place if there are any doubts as to the fit of prebored holes.

Preservative Penetrates

E. S. Birkenwald
Engineer of Bridges, Western Lines, Southern, Cincinnati, Ohio

Preboring bridge and trestle ties before being given preservative treatment is desirable to insure penetration of the preservative in the tie plate area and to avoid possible damage to the tie when driving track spikes. Usually four holes per rail are provided, only two of which are filled with spikes unless curvature requires the use of a third spike. Holes in which spikes are not driven serve to drain water from around the tie plate.

Preboring requires reasonable accuracy in locating the spike holes. This accuracy is especially difficult to obtain for ties to be placed on curved track, where the center line of tie coincides with the center line of span rather than the center line of track. Preboring further requires the stocking of bridge and trestle ties to accommodate different weights of rail, since the spike hole arrangement differs with each.

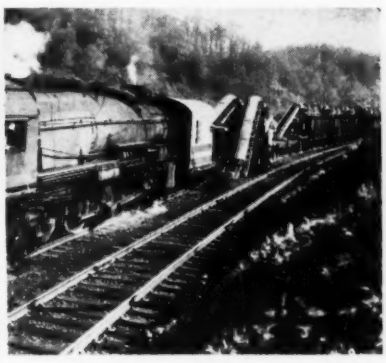
A compromise to obtain most of the advantages of preboring can be accomplished by providing, under

For additional information on any of the products exhibited on these pages, use postcards, page 835.

COST REDUCERS

McWilliams crib-cleaning machine—Railway Maintenance Corporation. An on-track, self-propelled car designed either to clean ballast excavated from cribs or to excavate cribs only. Forced to center of track by rams, crib ballast is picked up by bucket conveyors and cleaned on vibrating screens.

Power bow saw—McCulloch Motors Corp. Designed to cut timbers lying in any position without pinching. Driven by a 5-hp. engine which can be operated in any position. Saw equipped with automatic clutch, kick-proof starter. Replaceable chain track and blade are made of tool steel. Other saws available.



Speno Ballast Cleaner—Frank Speno Railroad Ballast Cleaning Company, Inc. Pulled by a locomotive, cleaning unit gathers ballast in scoops lowered on each side. Conveyors carry ballast to top of an inclined vibrating screen that cleans and returns it to roadbed. Dirt is cast along right-of-way or into cars.

each rail, three holes bored in a diagonal line at six-inch centers longitudinally and at two-inch centers transversely with the tie, so that each group of these holes falls on a straight line and is symmetrical about the center line of tie.* Such preboring will provide adequate penetration of preservative in the tie plate area, thus insuring the expected long life of the tie, even though track spikes may be pulled and redriven, and will afford means of draining water from around the tie plate, and thus lessen decay and tie-plate cutting.

* A Standard plan for trestle ties was shown in Fig. 1 on page 585 of the June, 1949, issue.

Governing Movement of Track Cars

What is the most satisfactory method of governing the movement of track motor cars from the standpoints of safety and delays to work?

Follow Rules Literally

By D. W. Naff
Superintendent Safety, Norfolk & Western Railway, Roanoke, Va.

In approaching this question, it should be borne in mind that varying physical and operating conditions on American railroads make it difficult, if not impossible, to formulate a definite set of rules or instructions to govern the movement of track motor cars, suitable for all railroads. The Standard Code of Operating Rules contains a number of rules pertaining to the safe operation of motor cars, many of which are applicable to all railroads, but they do not meet all of the needs of all railroads. Therefore, such additional rules and instructions as the experience of individual railroads, based upon a close study and careful analysis of their motor car accidents, may seem to require, should be devised and, where practicable, embodied in their Standard Operating Rules. In addition, motor car operators should be so trained and supervised that they will comply, literally, with such rules and instructions. With these prerequisites in mind, the following requirements pertaining strictly to the movement of motor cars with respect to trains, other motor cars, and vehicles at grade crossings, should promote the safe operation of motor cars and minimize work delays:

(1) Motor car operators should have a standard watch, Book of Rules and current timetable in their possession, and be familiar with schedules and other train movements on the district over which they run.

(2) When practicable, before starting on a trip, motor car operators should inform themselves as to the location of all trains and ascertain if traffic is normal. They should understand that the information thus received is given as a matter of information only and does not in any manner abrogate rules requiring flag protection when or wherever required, and they should understand that operating conditions may require the running of additional trains or light engines at any moment after a line-up has been given.

(3) When motor car operators secure information over the telephone concerning the movement of motor cars and location of trains, they should state their name, location and points between which motor car is to be operated. The information received should be repeated by motor car operators to confirm their correct understanding of the information given them.

(4) After a foreman and others in charge of motor cars receive a line-up of trains, they should give this information to the members of their force, together with advice of the movements to be made and the work to be performed, before occupying the main track or engaging in work thereon.

(5) All occupants of motor cars, as well as the motor car operator, should keep a constant and sharp lookout in both directions for trains, motor cars or obstructions. Upon meeting a flagman, motor car should be stopped to ascertain the reason for flag being out.

(6) Motor cars should not be operated against the current of traffic on double track unless full protection is provided, and they should clear the time of all passenger trains by 10 min.

(7) Necessary precaution should be taken at curves and cuts where the view is obstructed, or where the side clearance is not sufficient to take the car off the track.

(8) Motor cars should not be operated within the limits of interlockings without conferring with the leverman and having an understanding with him that the movement to be made is protected. They should be kept under control while moving through interlockings and should be reported clear to the leverman when they pass out of interlocking limits. Motor car operators only should receive permission from leverman for the movement of motor cars through interlockings, and the same motor car operator should notify the leverman when the move is completed.

(9) Motor cars should be provided with

SUPPLIERS EXHIBIT

Flex-Toe claw bar—The Warren Tool Corporation. A spike puller with movable toes that automatically grab any piece of protruding metal. Can be used for pulling track spikes, boat spikes or headless rods.

Grade crossing panels—Koppers Company, Inc. The panels consist of selected hardwood timbers which are machined, impregnated with creosote and assembled with steel spiral drive dowels before shipment.

Armco Multi-Plate pipe—Armco Drainage and Metal Products, Inc. Curved, galvanized, corrugated steel plates assembled with bolts to form culverts, underpasses, sewers, etc., in wide range of sizes.

Airco Style 739 multi-flame tip—Air Reduction Sales Company. For oxyacetylene welding, heating, brazing and rail-end or frog-point hardening and welding operations. Available in sizes 6, 8 and 10.

a warning device, a red and white light, a red flag, and a supply of torpedoes and fusees.

(10) Motor cars should be equipped with suitable brakes for control of the car, and the brakes should be tested immediately after the cars are started.

(11) Motor cars should not be operated at night, except in cases of emergency, and, when so used, should not exceed a maximum speed of 10 m.p.h. at any point. They should be provided with a white light in front and a red light on the rear.

(12) The maximum speed of motor cars should not exceed 20 m.p.h. at any point, and the speed should be reduced to 6 m.p.h. over switches and frogs and while passing trains on the opposite track, moving through station grounds, or where pedestrians are likely to be struck. The speed of motor cars when approaching all grade crossings should be reduced so that positive stop can be made before entering crossing if occasion demands, and they should not move over a crossing at a speed in excess of 6 m.p.h. Warnings should be sounded continuously through stations, tunnels, and while passing trains or cars running or standing on adjacent track, and while approaching or passing over all grade crossings.

(13) Motor cars following trains should not approach nearer than 1,000 ft., unless the exact location of the train is known and speed is sufficiently reduced to insure against collision. Where more than one motor car is in operation, they should be run not less than 500 ft. apart, except when arriving at a point at which they are to be removed from the track, and at such places the speed should be reduced to such an extent as to insure against collision.

(14) Motor cars should not follow a train through a double-track tunnel until it is known to be clear, or enter a double-track tunnel when there is a train on the opposite track.

(15) Rules and instructions governing the safe operation of motor cars are of no benefit unless they are complied with. Safe men to operate motor cars are of paramount importance, which places upon supervisors the all-important duty of seeing that those who operate motor cars are properly instructed, trained and supervised to operate their motor cars in a safe manner.

Water Treated by Recirculation

What is the recirculation method of water treatment? What are its advantages and disadvantages? Explain.

Treatment Kept Uniform

By B. S. Snow
President, T. W. Snow Construction Co., Chicago

In our procedure for handling fluids in a lime-soda treating plant, we believe in passing all of the contents from the mixing compartment through the sludge blanket at the bottom of the settling compartment many times so that as the water emerges from this section it is crystal clear.

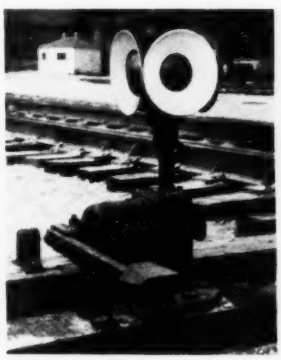
The advantages are several: (1) If the treating solutions have been out of adjustment temporarily, the sludge blanket tends to replace shortages and absorbes over dosages. This helps the water inspector to keep a more uniform water. (2) By reworking the sludge blanket many times, a smaller amount of chemicals is required. (3) Water treated in this way contains practically no suspended matter and thus insures clean pipe lines, clean water-crane valves, etc.

All of this is accomplished without mechanical equipment. The pressure of the water as it enters the treating tank is sufficient to provide quick and complete intermixture of the raw water and chemicals in the mixing compartment. As the water leaves the mixing compartments with a slight back pressure through a nozzle that jets it into the sludge blanket, the whole mass of water and sludge rotates very slowly. This eliminates all short circuiting. This procedure eliminates many parts in the old-type treating plants, and saves the maintenance costs of such parts. The rate of treatment can be increased considerably if desired. No disadvantages have been reported, as yet.

Answers to questions listed on page 871 are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

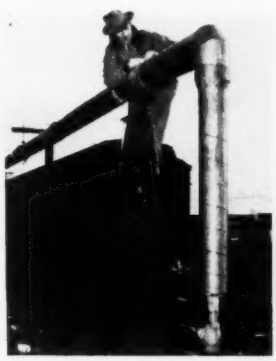
BETTER DESIGNS

Rust prevention — Rust-Oleum Corporation. Dipping structural steel members in a tank containing Rust-Oleum, a rust-preventive coating material, before placing them in storage, to protect against corrosion.

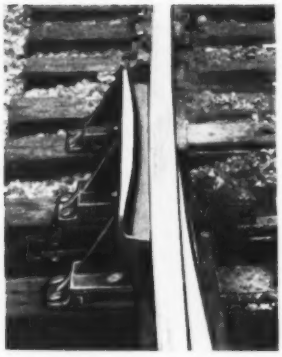


Racor Style 22 switch stand—American Brake Shoe Co., Ramapo Ajax Division. A heavy-duty adjustable unit for either automatic or hand-throw operation. Designed for use on busy switching turnouts.

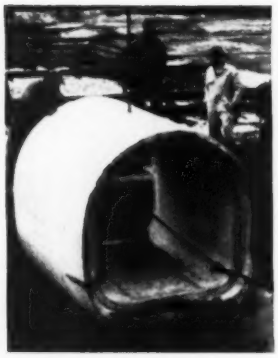
Dual-purpose generator—Homelite Corp. Available in 2500 and 5000-watt models. Generates both 230-volt, 180-cycle, a.-c. current for high-cycle tools, and 110-volt, d.-c. current for other tools, lights.



Prefabricated insulated pipe units—The Ric-wil Company. For underground and overhead distribution of steam, water, oil, compressed air, etc. Company offers systems to meet specific operating conditions.



Switch point guard—Q and C Co. Made of manganese steel, this device is used to reduce switch-point wear and to prevent derailments caused by sharp wheel flanges climbing on worn switch points.

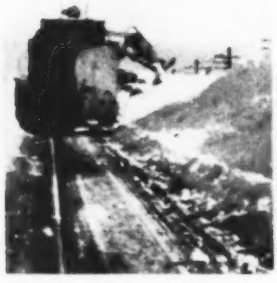


Flat-base pipe—Massey Concrete Products Company. Placing extra-heavy 68 in. by 68 in. flat-base tunnel pipe to carry steam and water lines beneath tracks of three parallel railroads in Chicago.

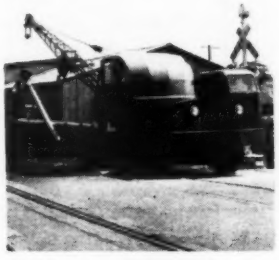
Rail inspection — Robert W. Hunt Company. Hunt inspector checking rail head contour. This company offers inspection service for all phases of rail making from the open hearth to the finished rail.

Tie pad — Bird & Son, Inc. For installation between ties and tie plates. Seals wood under tie plates, protecting the wood against moisture, and against wear due to abrasion. Designed to extend tie life.

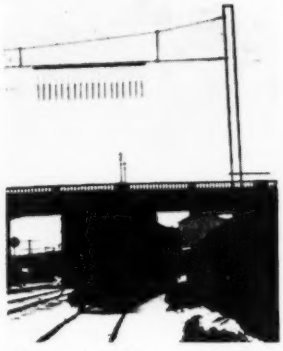
SUPPLIERS EXHIBIT



Jordan spreader - ditcher - snow plow in snow service—O. F. Jordan Company. An all-season machine for spreading, plowing, and shaping ballast, cleaning and cutting ditches, bucking snow drifts and flanging ice.



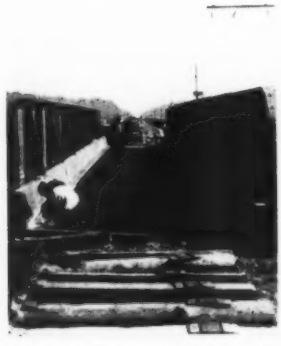
Truck - mounted shovel - crane, Model T-6-K—Michigan Power Shovel Co. Convertible to all standard attachments. Chassis engine operates both driving axle and turntable mechanism. Capacity, 6 tons, 3/8 cu. yd.



Hasco tell-tales — Hastings Signal & Equipment Co. When suspended by the Hasco hangers, these tell-tales can be released and replaced from the ground by one man using a Hasco replacer and a pole.

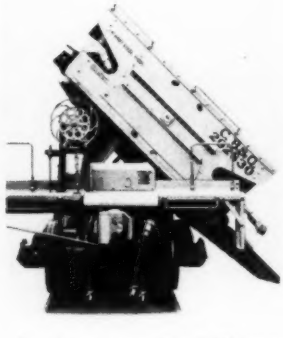
Poage Diesel water column—The Railroad Products Co. Requires no frost box; vertical column is drained after each use. Embodies features of the Poage water-hammer eliminator. Box-type unit also available.

SUPPLIERS EXHIBIT



Wrought-iron application — A. M. Byers Company. Applying all-welded wrought-iron deck plates on a ballast-deck girder bridge to protect structural members of the bridge against corrosive drippings.

A bridge deck of "Wolmanized" pressure-treated wood—American Lumber & Treating Co. "Wolman" salts offered as a wood preservative with fire-retardant qualities. Said to resist leaching or "bleeding".

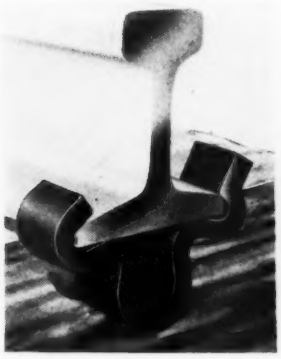


Air dump car—Austin-Western Company. One of the 30-yd., 50-ton units built for the C.B. & Q. These cars can be dumped independently or in combinations, either while standing or moving slowly.

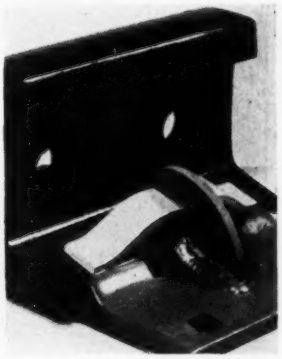
Terraflex—Johns-Manville Sales Corporation. Flexible plastic asbestos flooring. When placed, it conforms to uneven floor surfaces. Resists fire and scratching, and can be used below grade as well as above.

Anco-Nut—The Automatic Nut Co., Inc. A nut equipped with locking pin which establishes a ratchet-like impingement against the bolt, maintaining anchorage against vibration. For use on any standard bolt.

Improved Fair
The P. & M. Co.



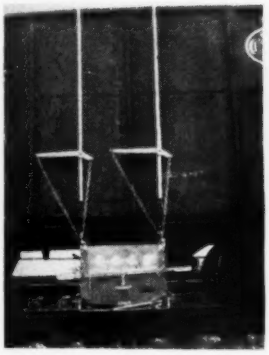
Advanced-Type Woodings
Woodings Forge & Tool Co.



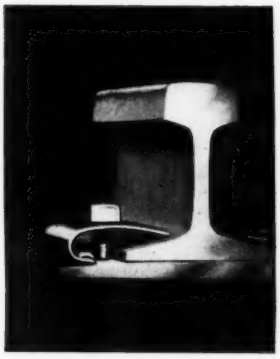
No-Creep
G & H Rail Controls, Inc.

Rail creepage is one of the most troublesome problems encountered in track maintenance. Failure to prevent rail from creeping results in track conditions that not only add to the cost of maintenance but also can be a hazard to the safe operation of trains. Consequently the rail anchor has come to be considered an integral part of the track structure. The result is that a . . .

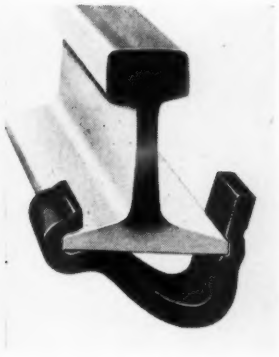
RAIL RETAINERS



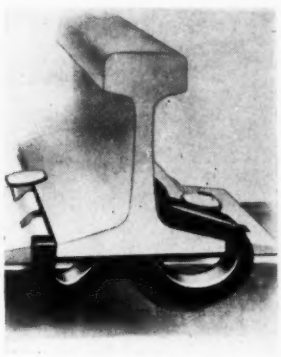
Automatic Ballast Spreader—Scientific Production Corporation. New aluminum-alloy spreader shown is being tested in actual service to prove its durability. Available model made of lightweight steel.



Compression
The Rails Co.



Unit
Unit Rail Anchor Co., Inc.



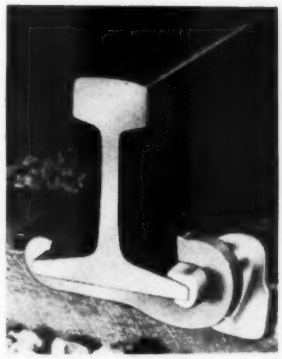
Improved Gautier
Mid-West Forging & Mfg. Co.

. . . large demand was created for these devices, and to satisfy this demand a variety of different designs has been developed and is now on the market. Nine of these types are shown on this page. The question today is not whether rail anchors should be used, but how many should be employed and how should they be arranged. To answer these questions the American . . .

EFFECTIVE DEVICES

Fabco tie pads—The Fabreeka Products Company. Designed for installation under tie plates to reduce plate cutting and mechanical wear of crossties, switch ties and bridge ties. Made of fiber and rubber.

True Temper
True Temper Corp.

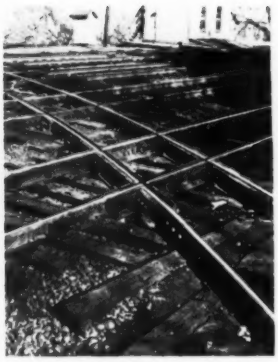


Ericson
Illinois Malleable Iron Co.

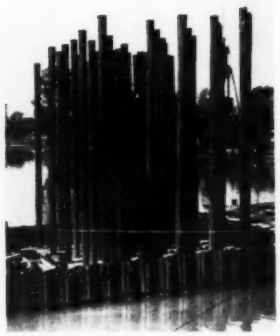
Weston
Positive Rail Anchor Co.

. . . Railway Engineering Association carried out an exhaustive investigation. As a result recommendations were adopted to the effect that where traffic is essentially in one direction a minimum of 8 anchors per 39-ft. rail is required, plus at least two back-up anchors per rail length. For track carrying traffic in both directions the use of 16 anchors per rail length is recommended.

Rolling steel doors—The R.C. Mahon Company. For freight-houses, enginehouses, Diesel shops and similar buildings. Can be equipped for manual, mechanical or power operation to meet requirements.



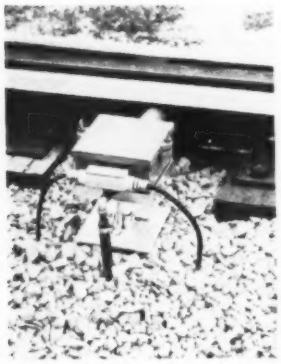
Special trackwork — Bethlehem Steel Company. Multiple installation of heat-treated bolted crossings on the Lehigh Valley. Company has extensive facilities for heat treating special trackwork.



Monotube piles—Union Metal Manufacturing Company. Cold-rolled, fluted steel tubes for trestles and piled foundations. Available in various sizes, tapers and gages. Can be driven without use of core.

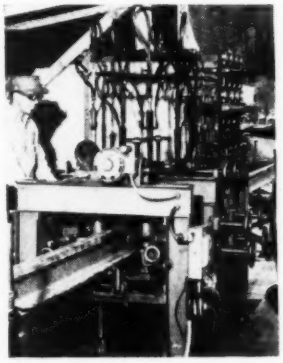
Rex Pumpcrete—Chain Belt Co. Constructing a pier on the Erie, using a machine that pumps concrete by pipe line. On this job concrete was pumped under 15 tracks, elevated and placed in one operation.

SUPPLIERS EXHIBIT



Remote-control apparatus — White Manufacturing Co. For automatically lighting White switch heaters at any distance from tower or control station. Also keeps heaters lit without action by tower operator.

Vapor-dried crossties — Taylor-Colquitt Co. Vapor-Drying process is a method of seasoning wood by exposure in a closed vessel to the heat of vapors formed by boiling organic drying agents. Reduces checking.



Pressure-welding machine—Oxweld Railroad Service Company. A unit in operation on a recent Great Northern project in which four track miles of continuous welded rail were installed in the Cascade tunnel.

Collar National Grooved Spring Washer—National Lock Washer Co. Conforms to A.R.E.A. specifications. Has a groove in its inner periphery to minimize the internal stresses induced in fabrication of the washer.

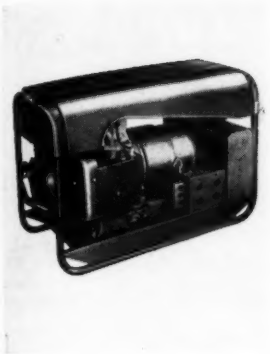
SUPPLIERS EXHIBIT

Libbey-Zone process for fire protection—The Zone Company. Involves use of Zone asphalt-asbestos products combined with gravel or rock chips. Forms a fire-resistant coating for wood parts of bridges.

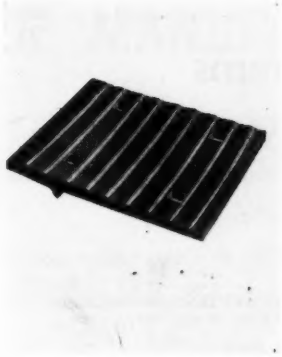
Inland 4-Way safety plate—Inland Steel Company. Rolled steel flooring material with a raised lug pattern which provides traction and offers resistance to slipping. Resists corrosion by chemicals.

Power chain saw—Henry Disston & Sons, Inc. A 30-in. gasoline-powered saw being used as a two-man unit. It can be converted into a one-man bucking saw by removing the handle at the end of the blade.

Sidewalk snow plow—Gravely Motor Plow & Cultivator Co. Driven by a 5-hp. gasoline engine and controlled by one man. Blade angle can be reversed, or blade can be set straight for bulldozing work.

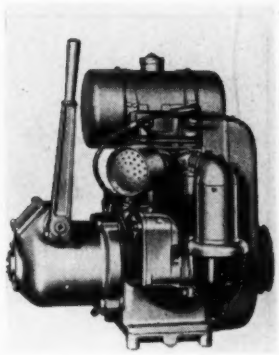


Onan electric generator. Model 5CK-115P—D. W. Onan & Sons, Inc. A 115-volt, 5000-watt power plant for the operation of lights, electric tools and other universal electric equipment. Driven by Onan engine.



Lundie tie plate—Lundie Engineering Corp. A canted plate with a stepped bottom designed to resist sliding. Steps are inclined so that load on plate is at right angles to bearing surface of each step.

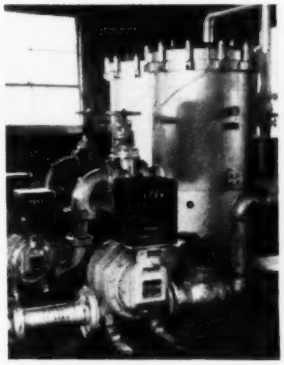
Phil Alloy Power Plus spring washer—Phi'adelphia Steel & Wire Corporation. Conforms to requirements of the American Railway Engineering Association. Heat treated under automatic control of temperature.



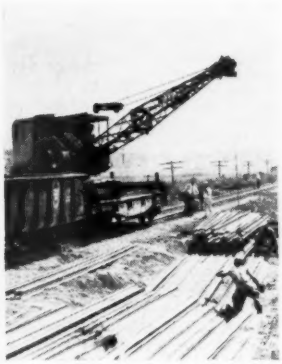
Wisconsin air-cooled carburetor-type engine with clutch assembly—The Wisconsin Motor Corporation. Used extensively as the integral power unit for railway work equipment. Available in a wide range of sizes.

VARIED PRODUCTS

CP-5 gasoline-driven tie tamper—Chicago Pneumatic Tool Co. A self-contained unit powered by two-cycle engine with magneto ignition. Starts by pressure on one of the grip handles. Automatic lubrication.



Bowser expendable-cartridge, Diesel fuel-oil filters connected to Bowser Meters—Bowser, Inc. Recording meters provide a permanent inventory record of the volume of fuel oil added to or withdrawn from storage.

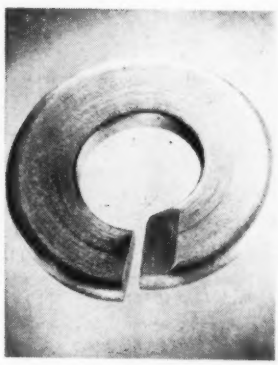


Lorain crawler crane—The Thew Shovel Company. Unloading and stockpiling rails on the Monon in preparation for welding. Company offers a wide range of crane mountings to serve all types of railroad jobs.

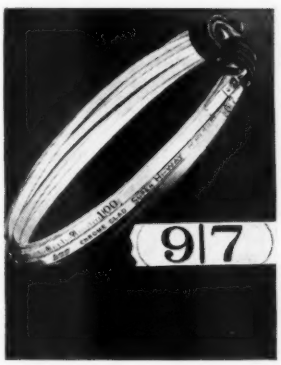
Safety hand tongs—Mack Welding Co. For manually lifting ties and other timbers. Grip on timber tightens as lifting pressure is applied to handle. Has a capacity of 600 lb., is 15 in long, and weighs 3 lb.

EFFICIENCY AIDS

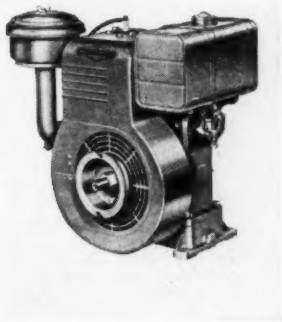
Prehy grouter—The Prehy Co., Inc. Portable pressure grouting unit for roadbed stabilization or pneumatic concrete construction work. Operating air pressures up to 150 psi., discharge capacity, 3.5 cu. ft.



Reliance improved Frog and Crossing Hy-Crome spring washer—Eaton Manufacturing Co., Reliance Division. Wide section provides full bearing surface for wide crossing-bolt nuts. Furnished in four sizes.



The Super Hi-way, chrome-clad chain tape—Lufkin Rule Company. Made of special flexible steel, heavily chrome-plated to produce a chrome-white surface that resists corrosion and makes figures easy to see.



Gasoline engine — The Briggs & Stratton Corp. Four-cycle, air-cooled unit for powering tools and equipment. Three models available: 3.1 hp., 5.1 hp. and 8.25 hp. Equipped with a Magnematic ignition system.

Programs

Concurrent Annual Conventions of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge & Building Association

HOTEL STEVENS, CHICAGO, SEPTEMBER 12-14, 1949
(All Sessions Chicago Daylight Saving Time)

JOINT SESSIONS
MONDAY, September 12

*10:00 a.m.—Joint conventions called to order.
Welcome by presidents of the Roadmasters' and B. & B. associations.
Greetings from the Track Supply Association.
Greetings from the Bridge & Building Supply Men's Association.
*10:15 a.m.—Opening address by J. H. Aydelott, vice-president, Operations and Maintenance department, Association of American Railroads.
*10:40 a.m.—Joint announcements.
*10:45 a.m.—Adjournment to the separate sessions of the two associations.

ROADMASTERS' SESSIONS

11:00 a.m.—Address by President R. L. Fox
11:20 a.m.—Report of Committee on Stimulating Interest of Young Men in Maintenance-of-Way Work as a Career—W. M. S. Dunn, Chairman (general roadmaster, N.Y.C. & St. L., Bellevue, Ohio).

BRIDGE & BUILDING SESSIONS

11:00 a.m.—Address by President E. H. Barnhart
11:20 a.m.—Report of Committee on Installation and Maintenance of Built-Up Composition Roofs—W. H. Bunge, Chairman (assistant engineer, M.P., Houston, Tex.).

MONDAY AFTERNOON

2:00 p.m.—Reports of Committee on Economies To Be Gained Through the Proper Distribution of Ballast—A. W. Schroeder, Chairman (chief engineer, C. & E.I., Danville, Ill.).
2:30 p.m.—Report of Committee on the Relation of Supervision to Maximum Production of Track Gangs—O. H. Carpenter, Chairman (general roadmaster, U.P., Pocatello, Idaho).
3:00 p.m.—Adjournment to attend the Railroad Fair.

2:00 p.m.—Report of Committee on Safety in Transportation of Men and Material—J. M. Giles, Chairman (assistant engineer, M.P., St. Louis, Mo.).
2:30 p.m.—Report of Committee on Methods and Materials for Fire Protection for Bridges and Trestles—L. R. Morgan, Chairman (fire prevention engineer, N.Y.C., Detroit, Mich.).
3:00 p.m.—Report of Committee on Prolonging the Life of Ties on Bridges and Trestles—H. D. Curie, Chairman (master carpenter, B. & O., Garrett, Ind.).
3:30 p.m.—Adjournment to attend the Railroad Fair.

TUESDAY MORNING
September 13

*10:00 a.m.—Address on Maintaining the Railroads in 40 Hours, by F. S. Schwinn, president, American Railway Engineering Association, and assistant chief engineer, Missouri Pacific Lines in Texas and Louisiana.
*10:30 a.m.—General discussion of the various means being adopted to hold production up and hold costs down under the 40-hr. week.

11:00 a.m.—Report of Committee on Preventing the Abuse of Tools and Work Equipment—S. E. Tracy, Chairman (superintendent of work equipment, C.B. & Q., Chicago).

11:00 a.m.—Report of Committee on Methods of Preventing and Removal of Corrosion from Steel Structures—W. C. Harman, Chairman (supervisor bridges & buildings, S.P., San Francisco, Cal.).

TUESDAY AFTERNOON

*2:00 p.m.—Address on "What Now? You Can Help", by C. J. Geyer, vice-president, construction and maintenance, Chesapeake & Ohio, Richmond, Va.
*2:30 p.m.—Address on Personalizing the Safety Concept, by C. M. Kimball, vice-president in charge of safety, Southern Railway System, Washington, D.C.
*3:00 p.m.—Color, sound motion picture on "Use and Abuse of Track Motor Cars", courtesy, Illinois Central System.
*3:30 p.m.—Sound motion picture showing Mechanized Tie Piling, courtesy Stemm Bros., Inc., Leavenworth, Wash.

3:45 p.m.—Report of Committee on Developing Good Housekeeping Habits Among Track Employees—C. E. Neal, Chairman (general track supervisor, S.P., San Francisco, Cal.).

3:45 p.m.—Report of Committee on Disposal of Liquid Waste at Engine Terminals—J. A. Jorlett, Chairman (assistant engineer, Penna., New York).

TUESDAY EVENING
(Grand Ballroom—Informal)

*6:30 p.m.—Joint Annual Banquet of the Roadmasters' and Bridge & Building Associations—With Supply Associations.

WEDNESDAY MORNING
September 14

9:30 a.m.—Report of Committee on Recent Developments in Transportation of Maintenance-of-Way Track Forces and Materials—L. F. Barrs, Chairman (roadmaster, A.C.L., Richmond, Va.).
10:15 a.m.—Address on Railroading on the Pacific Coast, by G. L. Morrison, assistant engineer maintenance of way and structures, Southern Pacific, San Francisco, Cal.
11:00 a.m.—Business Session.
Election of Officers.

9:30 a.m.—Report of Committee on Developments in Modern Methods for Watering Passenger Coaches—by W. D. Gibson, Chairman (water service engineer, C.B. & Q., Chicago).
10:15 a.m.—Report of Committee on Pier Construction and Maintenance of Waterfront Terminals—F. W. Hutcheson, Chairman (supervisor bridges and buildings, C. & O., Newport News, Va.).
11:00 a.m.—Business Session.
Election of Officers.

WEDNESDAY AFTERNOON

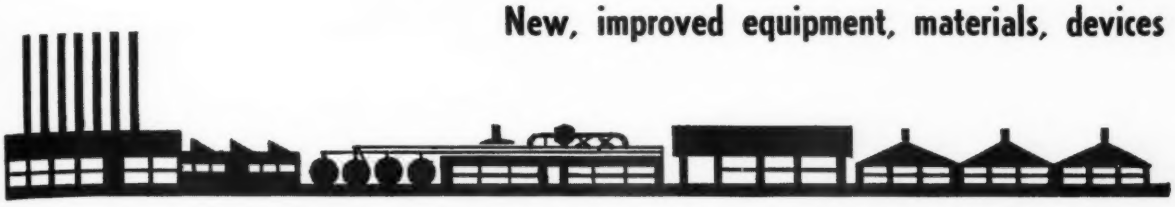
12:30 p.m.—Bus trip to inspect the foundry, frog and switch shop and products of the Pettibone-Mulliken Corporation, Chicago.

1:15 p.m.—Bus trip to inspect the modern wood preserving plant and operations of the Joslyn Manufacturing & Supply Company at Franklin Park (Chicago).

*Joint Sessions (will be held in North Ballroom).

PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices



(For additional information on any of the products described in these columns, use postcards, page 835)

WOOLERY MOTOR CAR

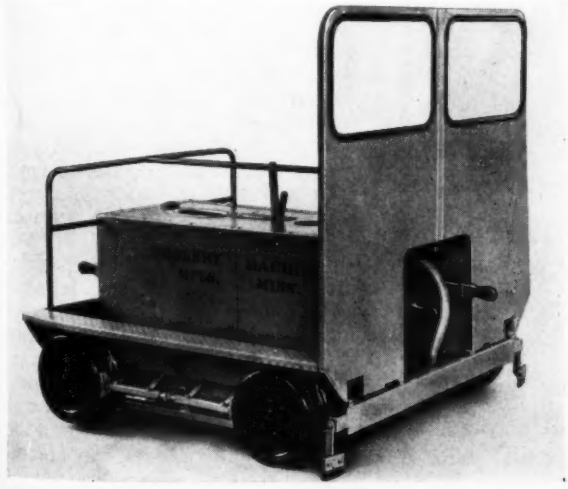
THE Woolery Machine Company, Minneapolis, Minn., has announced a lightweight heavy-duty motor car, designated as the Woolery No. 300, for section or extra-gang service, which features a four-wheel drive, a selective differential, a two-speed transmission either forward or reverse, a draw-bar pull of 405 lb., and a load capacity up to 20,000 lb. It is powered by a 2-cylinder, 4-cycle, 10-hp., air-cooled gasoline engine with a multiple V-belt drive to the transmission.

Both the front and rear axles of the car are divided, i.e., for each car there are four half axles which, with wheels and bearings, are all identical and therefore interchangeable, one with another. The transmission is located between the ends of the rear half axles, driving each half through a hardened splined steel sleeve which engages the splined end of the half axle.

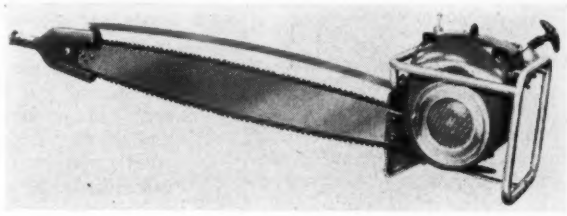
The four-wheel drive is accomplished by a roller-chain drive between the rear and front axles. The front half axles engage their splined ends in a broached sleeve which also forms a jaw clutch. By pulling a lever this clutch can be released as desired to provide differential action when it is necessary to remove the car from the track.

The main clutch is mounted directly on the differential and is provided with a standard 8-in. plate identical with that used in automobiles. The clutch is operated by two levers, one for shifting from forward to reverse and the other for shifting from low to high speed.

To provide insulation and to absorb shock and noise, the Woolery No. 300 is equipped with wood-center wheels. The four-wheel brakes are lever-operated. The frame of the car is of all-welded angle and channel steel. The engine and other moving parts are completely enclosed by body panels. The top is of one-piece construction and can be quickly removed for access to the engine or other mechanism. The windshield protects the full width of the car and is provided with safety glass mounted in rubber. For clearing the rails of light snow and small obstructions the car is provided with paddle-type rail sweeps, hinge-mounted just ahead of the front wheels.



The Woolery No. 300 motor car for section or extra-gang service



The Reed Prentice Timberhog "36" chain saw with chrome-plated chain

TIMBERHOG "36"

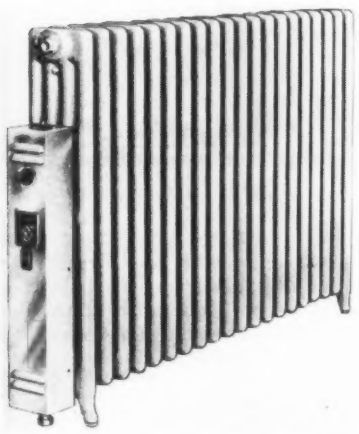
THE Reed Prentice Corporation, Worcester, Mass., has added to its line of portable power saws, a chain saw, known as the Timberhog "36", especially designed for cutting the heavy timbers used in construction and maintenance work. The saw is driven by a two-cycle, 4-hp. gasoline engine.

Special features of the unit include an anti-friction ball-bearing idler at the helper's end, an all-purpose chrome-plated chain which is said to have an unusually long life, a shock-proof design of the helper's end, a diaphragm carburetor which enables the engine to operate in any position, and a narrow guide bar which is said to minimize binding. Weighing 60 lb. complete, the saw can be handled easily by two men.

ELECTRIC STEAM RADIATOR

THE Koral Electric Manufacturing Company, Long Island City, N.Y., is introducing an electric radiator for steam heating rooms or buildings where there is no central heating plant. When heat is required, all that is necessary is to plug the radiator into an electric circuit and snap on a switch. A thermostat then automatically maintains a safe working

For additional information on any of the products described on this page, use postcards, page 835.



A Koral automatic electric steam radiator

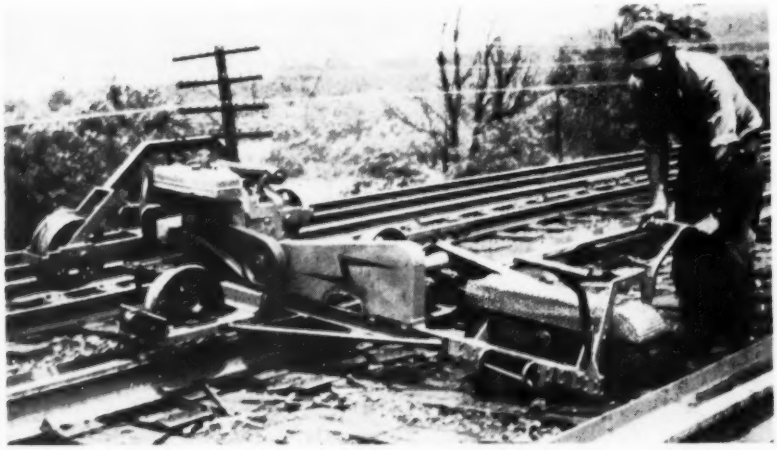
pressure and the desired temperature, cutting the current off and on as necessary.

The radiator is made of cast iron, has no exposed wires, and will not absorb oxygen from the air. It is available in portable and stationary models, operating on 110 or 220-volt a-c or d-c current.

BALLAST EXTRUDER

THE Railway Track-work Company, Philadelphia, Pa., has developed a new machine, called the Model P-46 Ballast Extruder, for lowering the ballast in the cribs before adzing the ties in connection with rail replacement work. This machine removes the ballast from between the ties by means of teeth mounted on an endless chain. The design is such that the displacement of the ballast into the intertrack space or to the shoulder takes place by a pushing action, thus, it is said, minimizing the possibility of covering up track materials to be used in the rail-laying work. Another feature of the design is that the surface of the ballast as lowered in the tie crib is level. The manufacturer points out that the formation of water pockets is therefore avoided.

The endless chain, together with hand grips for the operator, is mounted on one end of a frame which has two flanged wheels at the opposite end. Mounted at the same end as the wheels is a gasoline engine for driving the endless chain. Another pair of flanged wheels, embodied in a suitable frame, is provided so that the unit may be operated as a four-wheel machine for movement to and from work. To prepare the machine for operation the second pair of flanged wheels is removed and fastened to the opposite end of the unit, where it acts as a counterweight to the Extruder head, minimizing the effort on the part of the operator in raising and lowering it into the cribs.



The Model P-46 Ballast Extruder removes the ballast from the cribs by means of teeth operating on an endless chain

LOCOMOTIVE CRANE FOR LIGHTER WORK

THE American Hoist & Derrick Co., St. Paul, Minn., has announced a locomotive crane, known as the American Model 410, designed especially for high-speed work and for use on lighter jobs. Powered by an electric-starting 72-hp. Diesel engine, the crane has a rated capacity of 10 tons with a 40-ft. boom at a 12-ft. radius.

The features of the crane include a full-vision cab, tandem-band air-controlled clutches, a compactly-arranged machinery deck with all units easily accessible, all-welded construction, ball and roller bearings, precision-cut gears running in oil, and a quick-action boom hoist under positive control at all times.

The American Model 410 locomotive crane for lighter work

The crane has a three-speed selective transmission which allows shifting from one speed to another while the crane is in motion. Travel speeds in the three ratios are: 2¼ m.p.h., 8 m.p.h. and 15 m.p.h. The draw-bar pulls corresponding to these speeds are: 8,160 lb., 2,060 lb. and 950 lb. The Model 410 has a 7500 lb. single-line hoisting pull at 235 ft. per min. Its slewing speed is 2.5 m.p.h.

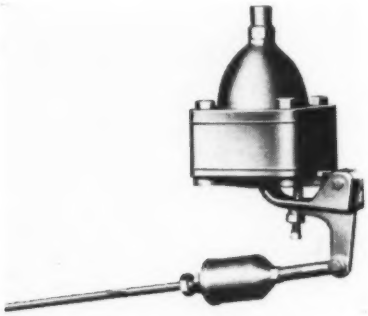
REGULATOR FOR I-R COMPRESSORS

INGERSOLL-RAND Company, New York, has announced an improved speed regulator for its line of portable compressors of 105 c.f.m. capacity and larger. The manufacturer reports that the regulator, designated as the UL-83 "Floating Speed" Regulator, permits 15 to 20 p.s.i. higher average air pressures, while fuel savings amount to as much as 40 per cent.

Use of the UL-83 allows the compressor to operate at more economical speeds. Thus, where the demand for air is less than the full capacity of the compressor, the engine is slowed down to the lowest practical speed that will hold the pressure at the demand point. A change in the demand will cause the regulator to

(*Continued on page* 886)

For additional information on any of the products described on this page, use postcards, page 835.



The Ingersoll-Rand UL-83 Floating Speed Regulator

increase or decrease the speed to suit the new requirement. Cycling of the compressor between full speed and idling is thus eliminated.

This regulator is reported as being similar to the Ingersoll-Rand Multi-Speed regulator, in use on 105 c.f.m. and larger compressors since 1939, in that speed is varied by adjustment of the engine governor spring. It also retains other advantages of the earlier model and is said to have a number of superior features.

BALLAST CLEANER BY PULLMAN-STANDARD

THE TWO ballasting machines—the Power Ballaster and the Power Track Cribber—now offered by the Power Ballaster Division of the Pullman-Standard Car Manufacturing Company, Chicago, are soon to be augmented by the Pullman-Standard Ballast Cleaner which, now undergoing final tests, will shortly be in production at the company's Hammond (Ind.) plant. Thus, the machines manufactured by this company will comprise a complete ballasting team; while each serves a separate function and may be used individually, they are designed as companion units and may be operated together in production-line sequence. Manufacture of the improved Power Ballaster was taken over by the company in 1947, and the Power Track Cribber was added early this year.

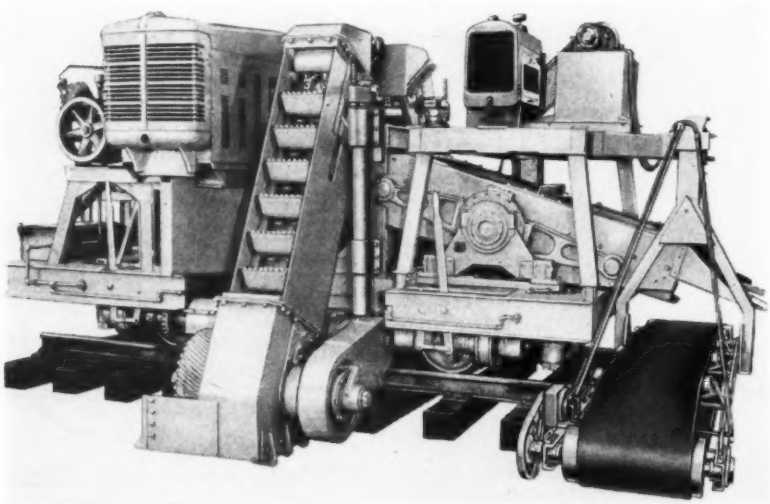
Like the other two machines the Ballast Cleaner is a self-propelled on-track unit which, by means of air-lift jacks and power-operated transverse wheels, may be readily removed from the track to clear for trains. On each side of the machine is a bucket-type ballast elevator terminating at its lower end in a rotary ballast cutter drum which loosens the ballast and delivers it to the elevator buckets. At the upper limit of their travel the buckets dump the fouled ballast onto a shaker screen from which the cleaner particles are returned to the roadbed through two chutes at the rear of the unit, one above each rail. The foreign matter screened out of the ballast is discharged onto a belt conveyor at the rear, which is pivoted so that the material may be cast on either shoulder as desired. By means of an auxiliary elevator the waste material may, if desired, be loaded into a following car.

The cutter drums, which rotate under power as the machine moves forward, are provided with interior helical transfer vanes that help to loosen the dirty ballast and deliver it to the elevator buckets. Forward edges of the drums and the helical vanes have serrated edges to enhance their cutting power. The depth of the digging action can be regulated to suit rail height and ballast conditions, with a depth of 3½ in. below the bottoms of the ties being recommended by the manufacturer as satisfactory to assure adequate drainage of the entire ballast section. This is the same depth as recommended for the cribbing operation.

The two elevators, with their cutting drums, are lifted and lowered by air cylinders and may be quickly folded into the clear in preparation for travel or for setting off the machine. Their lower ends are attached to the chassis by means of short-radius arms in such a manner that at no time during either the cleaning or the folding operation do the elevators foul adajcent tracks. The two elevators can be raised and lowered independently of each other, permitting the ballast on either or both sides of the track to be cleaned, as desired.

The machine weighs 40,000 lb. and travels to and from the site of the work at a speed of 25 m.p.h. The main power plant consists of a 100-hp. gasoline or Diesel engine, and in addition there is a separate engine for operating the shaker screen and for operating a pump which in turn drives an hydraulic motor on the conveyor for waste material. All operations of the machine are air-controlled, and an air compressor is provided for this purpose.

To obtain the advantages of parts standardization the various parts of the Ballast Cleaner, insofar as possible, duplicate those of the Power Ballaster and the Power Track Cribber. The power plants, the transmissions, the controls, and the clutches are among the parts that are identical in all three machines.



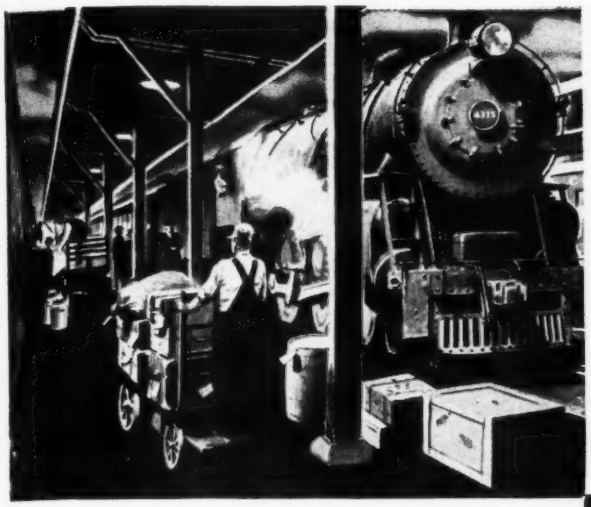
The Pullman-Standard Ballast Cleaner is a companion unit to this company's Power Ballaster and the Power Track Cribber

NORDBERG SCREENEX

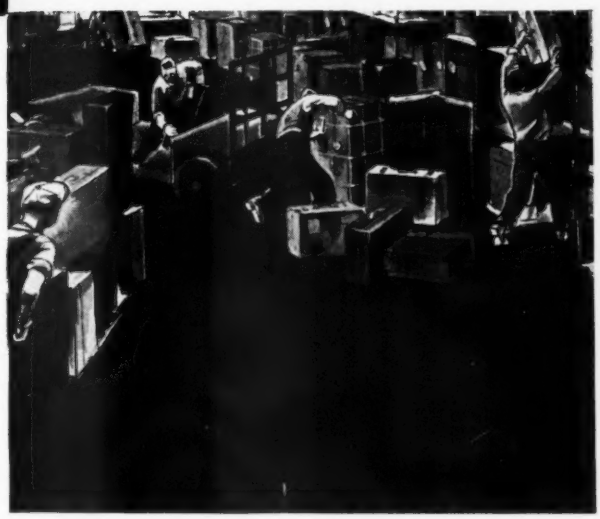
SUPPLEMENTING its Cribex and Ballastex machines, the Nordberg Manufacturing Company, Milwaukee, Wis., has developed the third unit of its ballast renovating equipment—the Screenex — which, in conjunction with the other two machines, is designed to handle any ballast reconditioning problem. The primary feature of the new Screenex is its screen, which is designed to insure effective separation of the dirt

(*Continued on page* 888)

Get More for Your Money with *Mastic*



. . . FOR STATION PLATFORMS, BAGGAGE ROOMS . . . AND SHOPS . . .



A mastic floor, cold-laid with Flintkote Flooring Emulsions, gives you many advantages over ordinary utility flooring.

You can lay it *fast*. Use a prescribed amount of Flintkote Flooring Emulsion (produced from selected asphalts to provide hardness and adhesiveness). Mix it with proportioned amounts of sand, crushed stone and a setting agent. Then apply over almost any clean, firm undersurface . . . either with hand trowel or power floats.

The result is a *heavy duty* floor that's ready for use in as little as 48 hours. It's extremely durable. It will take exceptionally heavy point or moving loads. Won't dust or shatter under trucking. Heals itself of minor scars and cuts. It's quiet and resilient . . . comfortable to walk and work on.

Be sure you consider this heavy duty floor the next time you have requirements for resurfacing or new construction. Ask for specifications. Check into it, and we're sure you'll agree...you get more for your money, with mastic.

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Products for Industry

Mastic Underlayment made from Flintkote Flooring Emulsion is the ideal leveling medium for use under decorative flooring in offices, waiting rooms, corridors, etc.

Here's a material that can be laid in thick or thin sections. Yet, even in a 3/8" film, it remains resilient, shock-absorbing and sound-deadening.

You can lay it quickly . . . obtain a true, level base. Apply it directly over steel, precast or monolithic concrete, etc. Application over wood takes special measures, so be sure to specify.

And for applying asphalt tile, cork, resinous compositions, rubber tile and other decorative floorings . . . use Flintkote Tile Cements, to insure a firm, durable bond and smooth finished installation.

FLINTKOTE MAKES A COMPLETE LINE OF SPECIALIZED RAILROAD PRODUCTS... Asphalt Protective Coatings...Car Cements...Insulation Coatings . . . Cold-Laid Mastic Flooring Emulsions . . . Building Materials . . . Materials for Waterproofing and Dampproofing.

For additional information on any of the products described on this page, use postcards, page 835.

and stone, regardless of the moisture content of the fouled ballast.

The Cribex machines, which were described in the January, 1947, issue of *Railway Engineering and Maintenance*, remove all ballast from the cribs, depositing it on the shoulders. The Ballastex, which was described in the March, 1949, issue, in conjunction with ballast-removal work on the Burlington, excavates the shoulder and intertrack ballast, including any ballast removed from the cribs by the Cribex machines, and either wastes the material outright or, with the Screenex, cleans all of the ballast, wasting the dirt, and depositing the clean stone back in the track at any point desired.

The Screenex is a compact, wheel-mounted unit, involving a feeding conveyor, a vibrating screen, discharge conveyors for returning the cleaned stone to the track and the screenings out beyond the track shoulder, and drive mechanisms for operating the screen and conveyors. It is always operated in conjunction with the Ballastex, to which it is coupled when in use. The Ballastex picks up the ballast from the intertrack or shoulder and, by means of conveyors, feeds it into the receiving conveyor of the Screenex. This conveyor elevates the ballast to the top of a Symons Rod Deck screen—a type of screen developed by Nordberg's Crusher & Screen division to fill the need of the mining industry for a screen which will handle wet and gummy material.

The screen of the Screenex is essentially a series of banks of steel rods set in rubber, the individual rods of which can be set any distance apart so that they will screen out material of any specified size. As a whole the screen is vibrated by means of an eccentric weight driven by a LeRoy 30-hp. gasoline engine. The engine also drives hydraulic pumps, from which oil is fed to hydraulic motors, which, in turn, drive the various conveyors.

Dirt screened from the ballast falls onto a belt conveyor mounted under the screen and is carried to a 20-ft. waste conveyor at the rear of the machine, which has a 270-deg. swing for disposing of the dirt to either side of the track. The length of this conveyor and its belt speed combine to throw the dirt clear of the shoulder of an adjacent track at 14-ft. centers.

The cleaned stone can be returned to the track as desired—alone to empty cribs, alone to the intertrack space or shoulder being cleaned, or divided between the cribs and intertrack or shoulder in any proportion.

Another feature of the machine is that, to insure maximum screening efficiency on curves, regardless of the superelevation, the entire superstructure of the machine can be raised on either side by means of short rams and a hand-operated hydraulic pump, to keep the machine vertical at all times. Still another feature of the machine is that it can be readily removed laterally from the track by means of these same rams and transverse-mounted dolly wheels on the underframe.

The Ballastex-Screenex combination is propelled by an hydraulic motor-actuated winch mounted on the forward end of the Ballastex, which takes in on two 120-ft. lengths of chain which are run out ahead of the equipment progressively and anchored to a tie.

The forward speed of the units varies with the amount of material to be handled. Actual performance to date, when cleaning material in the shoulder or intertrack only, has averaged a rail length (39 ft.) in 1½ min. Maximum daily production to date has been 5,577 track feet of intertrack in 5½ on-track hours.

The force required to operate the Ballastex-Screenex includes two operators, a foreman, flag protection as required by railroad rules, and three trackmen—one of whom handles the propelling chains, one the waste conveyor and assists the Screenex operator, and the third, who acts as a watchman.

The Screenex, like the Ballastex and Cribex, is available on a lease basis, under which Nordberg furnishes service, an instructor and repair parts, while the railroad furnishes the operating force and fuel and oil.

Left — The Nordberg Ballastex-Screenex combination, showing the excavating and elevating bucket conveyor of the Ballastex in action

Below—A rear-side view of the Ballastex - Screenex, showing the 20-ft. waste conveyor of the Screenex carrying the dirt screenings across a track to the roadway shoulder

"HIGHBALL" THROUGH MAINTENANCE JOBS WITH COST-CUTTING BLUE BRUTES

Blue Brute 60' Hand-I-Air Compressor

Blue Brute WTT-17 Tie Tampers

...Like this feature-filled track-team

Here's expertly engineered portability that will save you time and dollars on every job. The light, strong Blue Brute Hand-I-Air has ❶ 600x16 pneumatic tires for easy riding over right-of-way shoulders . . . ❷ adjustable dolly wheels for single-rail use . . . ❸ telescoping handle bars that act as bumpers during shipping . . . and ❹ a lifting bale for quick hoisting. In action, there's push-button control . . . Worthington Feather* Valves for continuous, maximum air delivery . . while ❺ the Automatic Fuel Saver regulates engine speed to air consumption, reducing wear, prolonging compressor-life.

You'll hang up high speed surfacing records when you hook up these Blue Brute team-mates – 4 WTT-17 Tie Tampers. Easy-handling 42-pounders, they are packed with hard-slugging power and kept at peak by ❻ foolproof, built-in lubrication which feeds a constant film of oil to piston and cylinders . . . ❼ positive locking throttle control with dust-proof replaceable bushing for low-cost maintenance . . . ❽ replaceable, hardened nickel steel throttle valve bushing providing leak-proof seat . . . ❾ adequate freeze resistant exhaust opening . . . and ❿ independent venting of cylinder, allowing piston hammer to strike harder.

Investigate the many Blue Brute combinations you can team up for faster, better, lower-cost performance on track, bridge and building work. Write for further facts proving there's more worth in a Blue Brute.

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THE MONTH'S NEWS

Happenings among the railways—the associations—the suppliers

Changes in Railway Personnel

General

H. T. Frushour, assistant vice-president and chief engineer of the former New York zone of the Pennsylvania, with headquarters at New York, retired on September 1.

Charles Edward Smith, vice-president, purchases and stores of the New York, New Haven & Hartford, at New Haven, Conn., and formerly bridge engineer and assistant chief engineer of the Missouri Pacific, has retired at the age of 72 years.

F. J. Corporon, assistant superintendent way and structures, Chicago South Shore & South Bend, has been advanced to superintendent way and structures, at Michigan City, Ind., succeeding the late **W. J. Mallon,** whose death was reported in the July issue.

Ralph Budd, president of the Burlington Lines, and an engineer by training and experience, having been chief engineer of the Great Northern, has retired, effective August 31. **H. C. Murphy,** vice-president (operation), and also an engineer by training and experience, has been elected president to succeed Mr. Budd, with headquarters as before at Chicago.

P. O. Ferris, chief engineer of the Delaware & Hudson, with headquarters at Albany, N.Y., has been appointed also assistant general manager, succeeding to a portion of the duties of **George D. Hughey,** assistant vice-president and assistant general manager, who has been appointed general manager in charge of operations, maintenance, construction and purchases and stores. Mr. Hughey replaces **Glenn H. Caley,** who has retired.

Engineering

James Beaton, engineer on the Canadian National at Vancouver, B.C., retired recently after 37 years' service.

W. S. Sloatman, division engineer on the Reading, with headquarters at Tamaqua, Pa., has been transferred to Philadelphia, Pa.

Frank R. Woolford, whose promotion to chief engineer of the Western Pacific, with headquarters at San Francisco, Cal., was reported in the August issue, was born on August 14, 1901, at Little Rock, Ark. He attended the Georgia School of Technology from 1920 to 1924, and entered railroad service on September 1, 1924, as a rodman for the Missouri Pacific at Little Rock. He became an instrumentman in 1925, and, from 1930 to 1935, served successively as engineer of accounts at St. Louis, Mo., and Little Rock, and as instrumentman. He was subsequently appointed assistant engineer and roadmaster at Bonne Terre, Mo., and in September, 1935, was made track supervisor at Dupo, Ill., and later at St. Louis. He became roadmaster at El Dorado, Ark., in June, 1939, and in August, 1942, left the road to serve in the United States Army with the 759th Railway Operating Battalion in the European theatre. In January, 1946, Mr. Woolford returned to the M. P. as division engineer, Missouri and Memphis divisions, at Poplar Bluff, Mo., being promoted to assistant superintendent of the Joplin-White River divisions at Nevada, Mo., in June, 1948. He joined the W. P. as engineer maintenance of way and structures at San Francisco in December, 1948.

Frank R. Woolford

M. H. Croft, assistant engineer on the Canadian Pacific at Winnipeg, Man., has retired after 27 years' service.

J. W. Dansey, cost engineer on the Atchison, Topeka & Santa Fe, with headquarters at Montezuma, Kan., has retired from active service.

E. Q. Johnson, supervisor of track on the Wabash, with headquarters at St. Louis, Mo., has been promoted to division engineer at Moberly, Mo.

J. J. Clutz, assistant to chief engineer of the Eastern region of the Pennsylvania, at Philadelphia, Pa., has been appointed assistant chief engineer of the Eastern region, with headquarters at New York, effective September 1.

C. H. Burks, assistant chief engineer of the Seaboard Air Line at Norfolk, Va. has been appointed division engineer, with headquarters at Jacksonville, Fla. **J. R. Traphoner,** division engineer at Jacksonville, has been transferred to Tampa, Fla.

E. L. Kite has been appointed division engineer on the Chicago, Burlington & Quincy, with headquarters at Galesburg, Ill., where he succeeds **Charles Bayliss,** who has been assigned to other duties.

Holman F. Braden has been appointed assistant division engineer of the Nebraska division of the Chicago & North Western, with headquarters at Norfolk, Neb. He succeeds **James McMillan Dorris,** who has retired after 37 years of service.

Peter C. Fuller, roadmaster for four of the Canadian Pacific's subdivisions, with headquarters at Woodstock, N.B., has been promoted to division engineer of the Schreiber division with headquarters at Schreiber, Ont.

L. B. Hewlett, assistant division engineer of the Russell division of the Chesapeake & Ohio at Russell, Ky., has been promoted to division engineer of the Hocking division, with headquarters at Columbus, O., succeeding **R. C. Watkins,** resigned. **G. D. Mayor,** assistant division engineer at Huntington, W. Va., has been transferred to the Russell division, succeeding Mr. Hewlett.

A. L. Johnstone has been appointed assistant engineer in charge of valuation in the office of the district engineer of the New York Central System at Cincinnati, Ohio. He succeeds **B. A. Bertenshaw,** whose retirement, after 43 years' service, was noted in the August issue.

(Please turn to page 892)

"We Want to Go Over to Your Worktrain Spraying Service Next Year"

"As you know we have been using considerable of your 'HERBICIDOL' of recent years. Our roadbed has shown a marked improvement from year to year. We have been taking delivery in drums and doing our own spraying.

"Recently I exchanged information with the Chief Engineer of the Railroad that parallels our line. They also use 'HERBICIDOL'. It has seemed to me that their results are even better than ours and I find they have been awarding their spraying contract to you and their cost per mile is considerably less than ours.

"It would, therefore, seem that we have something to gain by discarding the idea of self service on spraying and hereafter we may want to have you do the application work for us."

• • • • • • • • •

THIS IS NOT AN UNUSUAL SITUATION

Our application men are experienced and they should have judgment exceeding that of a man who knows but little about the science of weed control.

In self service spraying, problems are involved where chemical has to be allocated to different division of one railroad. Frequently, one division will show an excellent kill and others only a blight. This may reflect drench application on the part of the early users and insufficient chemical distributed on territory on the tail end of the program.

There can be no question but that CONTRACT SPRAYING brings the most for the money in any weed control program. Almost invariably the railroads spend more per mile when attempting self service on spraying work.

Well designed equipment, the know how that only years of experience can give, bring benefits beyond the low price that we charge for worktrain spraying service. The time element alone brings great benefits since our daily accomplishment in spraying is sure to exceed that of a railroad doing their own spraying.

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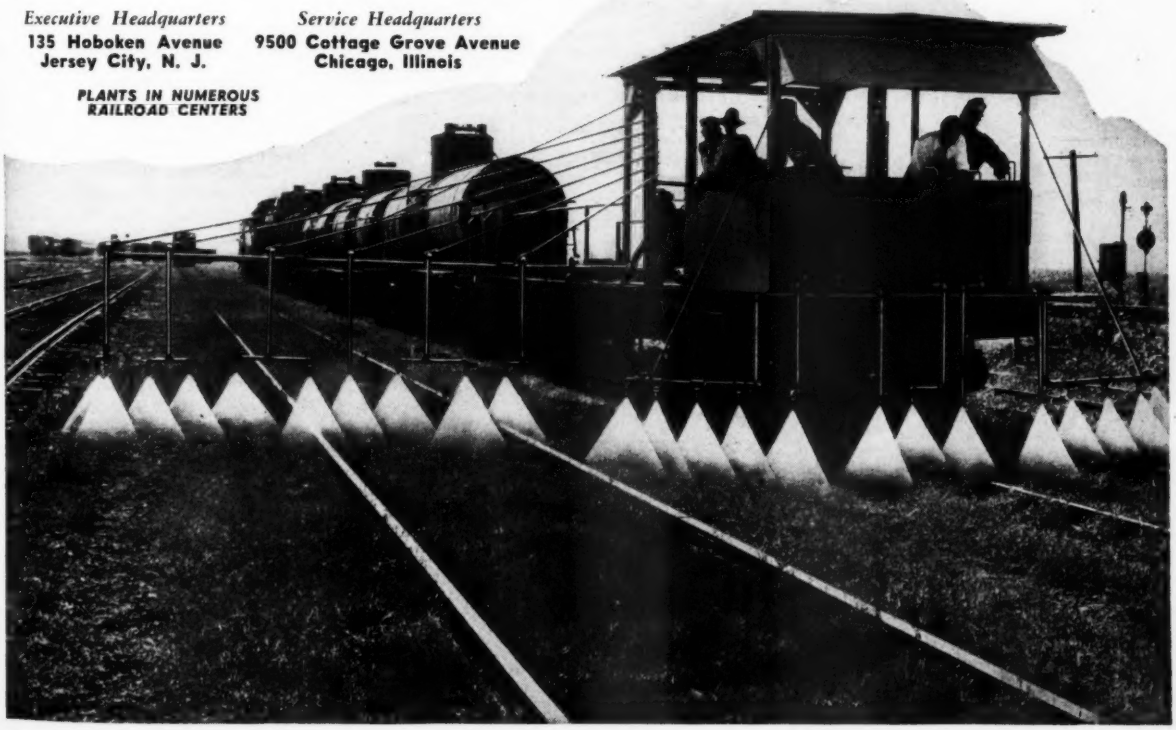
PLANTS IN NUMEROUS RAILROAD CENTERS



Railway Personnel (Cont'd)

J. C. Boyle, assistant engineer on the Central Vermont, has been advanced to assistant chief engineer, with headquarters as before at St. Albans, Vt., succeeding **J. E. O'Donnell,** who died recently.

Vincent S. Fowlow, whose promotion to division engineer on the Canadian National at Cochrane, Ont., was announced in the July issue, was born at Trinity East, Newfoundland, on February 3, 1901. He attended Tri-State College of Engineering in 1925 and 1926 and worked in an engineering capacity for various companies until 1936, when he entered the service of the C.N.R. as a draftsman. He was later advanced to instrumentman and, in 1942, to assistant engineer on the Montreal Terminals division, which position he held until his recent promotion.

Peter C. Fuller, roadmaster on the Canadian Pacific at Woodstock, N.B., has been promoted to division engineer of the Schreiber division, with headquarters at Schreiber, Ont. **J. E. Reynolds,** assistant engineer on the special engineer's staff at Toronto, Ont., has been transferred, as assistant engineer, to St. John, N.B. Mr. Fuller is a native of Montreal, Que., and is a graduate of McGill university. He entered the service of the C.P.R. in 1936, being assigned to the motive power department at Montreal. He was given a leave of absence in 1937 to study civil engineering and, following a period of military service, was assigned as draftsman at Toronto. Subsequently he was advanced to transitman at Smiths Falls, Ont., and to assistant roadmaster on the Montreal Terminals division.

C. R. Montgomery, who has been promoted to engineer maintenance of way of the Northern division of the Pennsylvania, as announced in the July issue, was born in Pittsburgh, Pa., and attended Tri-State College of Engineering, graduating in 1926. He entered the service of the Pennsylvania that year as a rodman on the Conemaugh division and was advanced to assistant supervisor of track in 1928. He became supervisor of track at York, Pa., in 1933 and was later transferred to Mansfield, Ohio. Mr. Montgomery was promoted to assistant division engineer of the Middle division, at Altoona, Pa., in 1942, and was advanced to division engineer of the Monongahela division, at Pittsburgh, in 1945. He was transferred in this capacity to the Cleveland division in 1947, returning to Pittsburgh later that year as division engineer of the Eastern division, which position he held at the time of his recent promotion.

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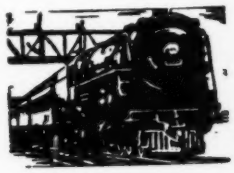

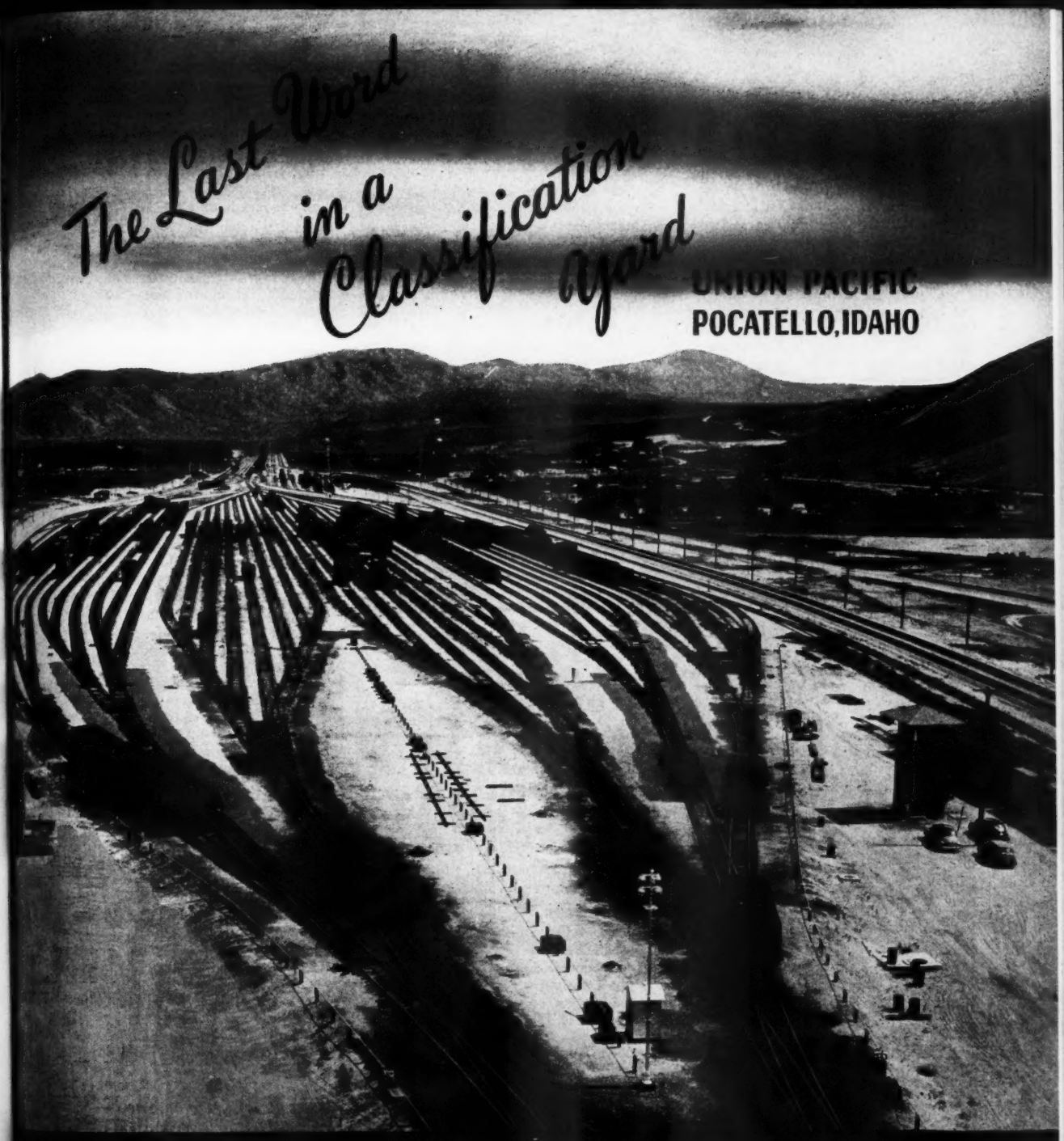

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Railway Personnel (Cont'd)

James R. Chasten, Jr., whose promotion to division engineer on the Atlantic Coast Line at Jacksonville, Fla., was announced in the June issue, was born on April 27, 1917, at Wilmington, N.C. He attended Georgia School of Technology and the University of North Carolina and entered the service of the A.C.L. as a chainman at Wilmington on June 14, 1940. He was advanced to rodman on December 26, 1940, and to draftsman on July 1, 1941. Subsequently, he was transferred as junior engineer to the office of the engineer maintenance of way at Jacksonville, and was advanced to assistant engineer on August 1, 1942. He was promoted to senior assistant engineer at Jacksonville on February 1, 1946, and held that position at the time of his recent promotion.

Leo S. Crane, whose promotion to engineer of tests of the Southern, at Alexandria, Va., was announced in the August issue, was born September 7, 1915, at Cincinnati, Ohio. He attended George Washington university, graduating in engineering, and entered the service of the Southern on May 24, 1937, as a laboratory assistant at Alexandria. He was appointed chemist in September, 1939, material inspector in April, 1941, and was advanced to chief material inspector in October, 1943. Mr Crane was promoted to assistant engineer of tests in January, 1946, and held that position until his recent promotion to engineer of tests.

V. H. Doyle, office and valuation engineer of the Pere Marquette district of the Chesapeake & Ohio at Detroit, Mich., has been appointed valuation engineer of the system, with headquarters at Richmond, Va. In his new position Mr. Doyle will continue to supervise the valuation accounting work of the Pere Marquette district and also succeeds to the duties of **C. A. Knowles,** who has retired as assistant to comptroller.

H. P. Morgan, whose promotion to assistant division engineer, special duty, in the office of the chief engineer of the Pennsylvania, with headquarters at Philadelphia, Pa., was announced in the August issue was born at Uniontown, Pa., on January 10, 1914. Upon graduating from West Virginia University in June, 1936, he entered the service of the Pennsylvania, serving as engineer apprentice and assistant on engineering corps on the Buffalo, Pittsburgh and Cleveland divisions and in the office of chief engineer maintenance of way of the Central region, until June, 1940, when he was advanced to assistant supervisor at Baltimore, Md. In April, 1941, he was furloughed for military service, and, on being released from the Army as Lieutenant-Colonel in the Transportation Corps, returned to the railroad in December, 1945, as supervisor on the Monongahela division at Shire Oaks, Pa. In April, 1947, he was transferred in the same capacity to the Fort Wayne division, at Crestline, Ohio, and in January, 1948, to the Pittsburgh division at Cresson, where he remained until his recent promotion to assistant division engineer.

Theodore W. Pinard, whose appointment as chief engineer of the Long Island, with headquarters at Jamaica, N. Y., was announced in the June issue, was born at Camden, N.J., on December 16, 1887. He attended Drexel Institute, taking night courses in structural and architectural design, took a course in civil engineering from the International Correspondence School, and received private instruction in reinforced concrete design. His railway career began in 1905 when he was employed by the Pennsylvania as a tracer at Philadelphia, Pa. Beginning in 1907, he spent a five-year period as draftsman and designer for the American Bridge Company and other companies, returning to the Pennsylvania in 1912 as draftsman and designer in the maintenance of way department at Philadelphia. He was promoted to bridge inspector at that point in 1915 and, in 1920, was advanced to assistant engineer of the Eastern Ohio division at Pittsburgh, being again promoted to assistant chief engineer maintenance of way of the Western region at Chicago in 1921. In 1929 he was advanced to engineer of bridges and buildings of the New York zone, with headquarters at New York, and was holding that position at the time of his appointment as chief engineer of the Long Island.

John R. Prizer, whose appointment as engineer maintenance of structures of the Central of New Jersey at Jersey City, N. J., was reported in the June issue, was born on March 22, 1886, at Pottstown, Pa., and was graduated from Lehigh University in 1908. Mr. Prizer entered railroad service in 1909 with the C. N. J. but from 1910 to 1915 was with the McClintic-Marshall Construction Company. He returned to the Central of New Jersey in 1915 and was serving as division engineer at Mauch Chunk, Pa., at the time of his promotion.

John M. Nicholson, who has been appointed assistant chief engineer of the Long Island, with headquarters at New York, as announced in the June issue, was born in New York City on September 26, 1881, and was graduated from Columbia University in civil engineering in 1903. In October of that year, he entered the service of the Long Island as a draftsman, advancing to assistant engineer in June, 1905. He was appointed assistant engineer of the Pennsylvania in October, 1928, and assistant to chief engineer of the Pennsylvania's New York Zone in November, 1939.

Carl H. Vogt, whose appointment as assistant engineer maintenance of way of the Central Railroad of New Jersey, with headquarters at Jersey City, N. J., was announced in the June issue, was born at Camden, N. J., on March 16, 1888. He graduated from Lehigh University in 1909, and began railroad service with the New York Central as a rodman in July of that year. In August, 1912, he was appointed assistant supervisor of track at Jersey Shore, Pa.; in January, 1914, assistant tie treatment inspector at Rome, N. Y.; in December, 1915, bridge inspector at Jersey Shore, Pa., and in January, 1923, supervisor of track, at Rochester, N. Y. In January, 1930, he went with the C. R. R. of N. J. as supervisor of track at Jersey City, N. J., being promoted to division engineer, the position he held at the time of his recent appointment, in July, 1945.

Bernard J. Minetti, whose appointment as engineer structures of the Central of New Jersey at Jersey City, N. J., was recently reported in the June issue, was born on March 28, 1906, at New York. Mr. Minetti was graduated from St. Augustine's Academy and Brooklyn Polytechnic Institute, receiving his civil engineering degree in 1927 and the degree of Master of Civil Engineering in 1941 from the latter. He also attended New York University, Department of Architecture. Mr. Minetti entered railroad service in May, 1929, as bridge designer with the Pennsylvania at New York and from November, 1929, to February, 1942, served with the New York Central at New York as bridge designer and detailer and as assistant engineer. He joined the C. N. J. at Jersey City on February 2, 1942, as structural draftsman, being appointed assistant engineer on February 1, 1946, and assistant bridge engineer on January 1, 1947. Mr. Minetti served as bridge engineer from June 1, 1947, until he became engineer structures.

(*Please turn to page* 896)

Railway Personnel (Cont'd)

O. W. Stephens, assistant engineer structures of the Delaware & Hudson, with headquarters at Albany, N. Y., has been appointed assistant to chief engineer—maintenance.

Hugh W. Johnson, whose promotion to chief engineer of the Chicago, Great Western, with headquarters at Chicago, was announced in the August issue, was born at Atlanta, Ga., on March 2, 1912. He attended high school at Birmingham, Ala., and the Alabama Polytechnic Institute, Auburn, Ala., working summer vacations as a railroad laborer. In December, 1936, he joined the Southern as a rodman at Cincinnati, Ohio, and in January, 1941, became a junior engineer at that point. After serving in a railway operating battalion in India as first lieutenant and captain from May, 1943, to February, 1946, he returned to the Southern as assistant engineer at Cincinnati. Mr. Johnson became assistant chief engineer of the Great Western at Chicago in January, 1949, which post he held until his recent promotion.

Frank Aikman, Jr., whose appointment as engineer maintenance of way of the Long Island, with headquarters at Jamaica, N. Y., was reported in the July issue, started his business career with the New Jersey State Highway Commission after his graduation from La-

Frank Aikman, Jr.

fayette College in 1932 with the degree of B. S. in C. E. In 1934 he joined the P. R. R. as an assistant on the engineering corps of the New York division and the following year went to the L. I. in the same capacity at Hicksville, N. Y. Returning to the Pennsylvania in 1936, Mr. Aikman served as assistant supervisor of track on the Delmarva and Maryland divisions. In August, 1939, he was promoted to supervisor of track on the Toledo division and thereafter served in that capacity on the Logansport, St. Louis and Pittsburgh divisions until 1946, when he resigned to enter the food processing business at Latrobe, Pa. In November, 1948, he became associated with the Railroad Siding Construction Company of Pittsburgh, from which he was appointed to his present position with the Long Island.

Track

J. R. McLean, roadmaster on the Canadian National, with headquarters at North Battleford, Sask., has retired.

W. H. Leach, roadmaster on the Canadian National at Edson, Alta., has retired after 39 years' service.

S. R. Nestigen, formerly drainage engineer of the Chicago & North Western, has been appointed roadmaster, with headquarters as before at Chicago.

W. N. Taggart, supervisor of track on the Pennsylvania, with headquarters at Grand Rapids, Mich., has recently been transferred to Monongahela, Pa.

N. W. Baxter has been appointed roadmaster on the Chicago, Rock Island & Pacific, with headquarters at Goodland, Kan., succeeding **N. H. Hurt,** who has been transferred.

R. C. Kleffman, assistant supervisor of track on the Pennsylvania at Cleveland, Ohio, has been transferred to the Eastern division, with headquarters at Federal street, Pittsburgh, Pa.

Richard W. Coburn, assistant engineer on the Canadian Pacific, with headquarters at St. John, N.B., has been appointed roadmaster, with headquarters at Woodstock, N.B., succeeding **Peter C. Fuller,** whose promotion to division engineer is announced elsewhere in these columns.

J. M. Greenfield has been appointed roadmaster in charge of the First district of the Atchison, Topeka & Santa Fe, with headquarters at Clovis, N.M., succeeding **J. E. Emond,** who has retired.

Claude R. Carroll has been appointed track supervisor on the Bluford district of the Illinois Central, with headquarters at Reevesville, Ill., succeeding **Brasher A. Williamson** who has been transferred to Carbondale, Ill., where he replaces **Albert A. Witter,** whose promotion to supervisor of tracks and trains was announced in the August issue.

Special

Roy S. Belcher, manager of treating plants of the Atchison, Topeka & Santa Fe System, with headquarters at Topeka, Kan., has, at his own request, been relieved of his duties. **D. L. Murray,** assistant manager of treating plants, at Topeka, has been promoted to succeed Mr. Belcher.

Mr. Belcher was born in Stoughton, Mass., on January 6, 1883. From 1906 to 1907 he studied a special course in industrial chemistry at Lombard College, and also attended Knox College and Brown's Business College, both at Galesburg, Ill. Mr. Belcher entered railroad service in April, 1904, with the Chicago,

Roy S. Belcher

Burlington & Quincy in the supply department as stenographer and lumber clerk, and later worked part time in the storehouse office while attending college. From August, 1907, to October, 1910, he served as a chemist in the wood preserving plant at Sheridan, Wyo., and in 1911 was appointed chemist for iron, steel and water analysis in the test laboratory at Aurora, Ill. In 1912 he joined the Texas Tie & Lumber Preserving Co. (now Santa Fe Tie & Lumber Preserving Co.), an affiliate of the Atchison, Topeka & Santa Fe, serving as treating plant chemist, at Somerville, Tex. From 1913 to 1915, Mr. Belcher served successively as chemist to manager of treating plants, as superintendent of the treating plant at Albuquerque, N.M., and as superintendent of the Santa Fe Tie & Lumber Preserving Co., respectively. He was advanced to manager of treating plants of the Santa Fe System in April, 1920.

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Railway Personnel (Cont'd)

C. C. Michie, assistant insurance engineer of the Chesapeake & Ohio, has been promoted to insurance engineer, with headquarters, as before, at Cleveland, Ohio. He succeeded **C. C. Strong,** who retired recently.

Bridge and Building

W. H. Whan has been appointed bridge and building master on the Canadian Pacific at Toronto, Ont., succeeding **L. N. Kennedy,** who has been transferred.

Water Service

H. W. Rowley, watermaster on the Canadian Pacific at Lethbridge, Alta., retired recently after 27 years' service.

Marrow W. Cox, resident engineer on the Louisville & Nashville at De Coursey, Ky., has been appointed assistant engineer of water supply, with headquarters at Louisville, Ky., succeeding **K. P. Howe,** whose death was reported in the August issue.

Obituary

John Edward O'Donnell, assistant chief engineer of the Central Vermont, with headquarters at St. Albans, Vt., died on May 9.

Herbert Forsyth, retired engineer right of way of the Central Railroad of New Jersey, died on June 1, at his home in Long Valley, N.J.

Richard W. Sneed, retired track supervisor on the Memphis division of the Southern, died recently.

Oscar Suprenant, roadmaster on the Delaware & Hudson at Schenectady, N.Y., died recently after a long illness.

Harry Beck, retired roadmaster on the Canadian Pacific, died recently at Kaslo, B.C., at the age of 83.

W. H. Leach, retired roadmaster on the Canadian National, died recently at Edson, Alta.

P. C. Heck, retired roadmaster on the Canadian National, died recently at Gravenhurst, Ont. He was 90 years of age.

John M. Doorly, retired assistant chief engineer of the New York Central, Lines Buffalo and East, died at St. John's Riverside Hospital, Yonkers, N.Y., on August 4.

Cornelius C. Pelley, former supervisor of track on the Illinois Central at Chicago, died on July 8, after 26 years of service. Because of ill health Mr. Pelley obtained a leave of absence in 1937. Subsequently he returned to service as a clerk on a part-time basis, serving in this capacity until the time of his recent death.

Association News

Track Supply Association; B.&B. Supply Men's Association

In the absence of an exhibit at the concurrent conventions of the Roadmasters' Association and the American Railway Bridge and Building Association at Chicago in September, the Track Supply Association has deferred its annual meeting until September, 1950. However, the Bridge and Building Supply Men's Association will hold an annual meeting at the Hotel Stevens on September 14, at which the business transacted will include the election of officers and the filling of vacancies on the directorate.

Through the efforts of these two supply associations the historical exhibit that was presented during the Golden Anniversary convention of the American Railway Engineering Association in March, will be put on display in the corridor of the third floor at the Hotel Stevens during the Roadmasters' and Bridge and Building conventions. The exhibit has been loaned for this purpose through the courtesy of the National Railway Appliances Association.

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Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 14-16, 1950, Chicago. W. S. Lacher, secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting April 25-27, 1950. Rice Hotel, Houston, Tex. H. L. Dawson, secretary-treasurer, 1429 Eye street, N.W., Washington 5, D.C.

Bridge and Building Supply Men's Association—E. C. Gunther, secretary, 122 S. Michigan avenue, Chicago 3.

Maintenance of Way Club of Chicago—Next meeting, October 24, 1949. E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Walter L. Turner, Jr., secretary, 30 Church street, New York.

National Railway Appliance Association—R. B. Fisher, secretary; Lewis Thomas, assistant secretary, 59 E. Van Buren street, Chicago 5.

Railway Tie Association—Annual convention, September 12-14, 1949, Peabody Hotel, Memphis, Tenn. Roy M. Edmonds, secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, secretary, 59 E. Van Buren street, Chicago 5.

Association News (Cont'd)

American Railway Engineering Association

A total of 16 committees has scheduled meetings to be held in September, of which eight will hold their meetings at the Hotel Stevens, Chicago, during the concurrent conventions of the Roadmasters Association and the American Railway Bridge and Building Association, September 12-14. These eight committees include those on Maintenance of Way Work Equipment, which will meet on September 12 and 13; Economics of Railway Labor, September 13; Cooperative Relations with Universities, September 13; Buildings, September 13 and 14; Masonry, September 13 and 14; Records and Accounts, September 13 and 14; Rails, September 14; and Track, September 15. The Committee on Clearances will also hold a meeting at Chicago on September 13, but this meeting will be held at the association's headquarters at Chicago instead of the Stevens Hotel.

The other committee meetings to be held during September are as follows: Uniform General Contract Forms, September 7 and 8, association headquarters, Chicago; Wood Preservation, September 12, Peabody Hotel, Memphis, Tenn. (coincident with the first day of the annual convention of the Railway Tie Association); Highways, September 15 and 16, Greensboro, N.C.; Roadway and Ballast, September 15 and 16, General Brock Hotel, Niagara Falls, Ont.; Water Service and Sanitation, September 20, association headquarters, Chicago; Economics of Railway Location and Operation, September 20 and 21, Union League Club, Chicago; and Yards and Terminals, September 20-22, Hotel Statler, Buffalo, N.Y.

The mailing of the Proceedings for 1949 was completed in August, and it is expected that the Manual supplement will be mailed early in September. The Board of Direction, at a meeting held at Chicago on August 9, endorsed the recommendations of the various committees for research work to be carried out in 1950.

Railway Tie Association

The association will hold its thirty-first annual convention at the Hotel Peabody, Memphis, Tenn., September 12-14. The program of the three-day meeting contains a large number of addresses and committee reports, many of which are of direct interest to railway maintenance officers and others on the railroads specializing in tie production, treatment and utilization. Among the addresses in this category is one on the Economic Outlook for the Next 12 Months in Terms of Crossties, by Graham E. Getty, statistician, Association of American Railroads; another on the Problem of Peaks and Valleys in Tie Production, by B. N. Johnson, Koppers Co.; another on Crossties—Pacific Coast and the South—Comparison of Practices and Problems, by J. R. Cade, asst. pur. agent, Southern Pacific Lines in Texas and Louisiana; another on Ties, Poles and Lumber in the Lands Down Under, by M. S. Hudson, Taylor-Colquitt Co.; another on Crosstie Problems of the Engineer, by W. J. Hedley, asst. ch. engr., Wabash Railway; and still another on Forestry and a Railroad, by Robert N. Hoskins, industrial forester, Seaboard Air Line. Committee reports of special interest to users include those on the checking and splitting of crossties, mechanical handling of crossties, timber conservation, and tie specifications.

Supply Trade News

General

The **L. B. Foster Company,** Pittsburgh, Pa., has recently announced the opening of a new $150,000 plant at Houston, Tex. The plant has complete facilities to handle steel rails and steel products on its 12-acre site in the Burchfield Industrial District of Houston.

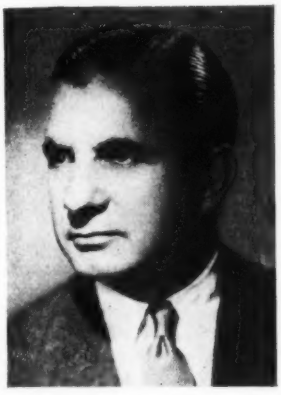
The **Armco Steel Corporation,** Middletown, Ohio, will begin construction soon of a new $12,000,000 steel-making plant which is to produce 400,000 tons of steel

ingots a year, Charles R. Hook, chairman, has announced. To be located south of the firm's East Works at Middletown, the facility will consist of three 225-ton open-hearth furnaces, five miles of railroad tracks, pipe lines, high tension lines and other similar installations necessary for operation of the plant. Construction is expected to require 15 months.

Conaway & Klaner have been appointed as the West Coast representatives of the **Simmons-Boardman Publishing Corporation,** publishers of *Railway Engineering and Maintenance* and other railroad periodicals and books. They will have two offices; one at 1914 Minors avenue, Seattle 1, Wash., and the other at 816 West Fifth avenue, Los Angeles 13, Cal.

Personal

Clarence Gush has been appointed special railroad sales representative for the **American Hoist & Derrick Co.,** St. Paul,



Clarence Gush

Minn. Along with other lines of materials handling equipment, Mr. Gush will handle the sales of locomotive cranes and other products manufactured by American Hoist & Derrick.

Templeton, Kenly & Co., Chicago, maker of Simplex jacks, has appointed **Mark C. Simpson** as Pennsylvania division sales manager, with headquarters at Roscoe, Pa.

D. W. Onan & Sons, Inc., Minneapolis, Minn., has appointed **John W. Thorp Company,** 50 Church street, New York, as Onan representatives for railway sales in New York and the New England area.

The **Chain Belt Company,** Milwaukee, Wis., has appointed **Douglas Jones** as manager of the firm's Salt Lake City (Utah) district office. He will operate his business as the **Douglas Jones Company,** 1551 Redondo avenue.

The finishes division of the **E. I. du Pont de Nemours & Company,** Wilmington, Del., has announced the appointment of **Theodore J. Mitchell** as industrial sales manager for the San Francisco (Cal.) region.

(*Please turn to page* 902)

Supply Trade News (Cont'd)

Fairbanks, Morse & Co., Chicago, has announced the appointment of **Frank M. Mason, Jr.,** as director of engineering, located at the firm's headquarters.

Howard Davies, field engineer in the Cleveland, Ohio, office of the **Warner & Swasey Co.** since 1940, has been assigned to the Syracuse, N.Y., district sales office.

Worthington Pump & Machinery Corp., Harrison, N.J., has announced the appointment of **John P. McArthur** to the position of manager of the West Coast sales, with headquarters at San Francisco, Cal. Mr. McArthur will supervise the activities of the district offices at Los Angeles, Cal., San Francisco, Seattle, Wash., and Salt Lake City, Utah, district offices.

Jonathan E. Teal, who retired on June 1 as transportation engineer of the Chesapeake & Ohio, after 40 years of railway service, has established an office as a consulting engineer at 3813 Brook road, Richmond, Va. Mr. Teal will specialize in economics of railway location and operation; railway abandonments and consolidations; joint terminal facility, trackage and lease agreements; and economic studies, surveys and reports. He will also make railway operating and transportation studies relating to Interstate Commerce Commission rate investigations.

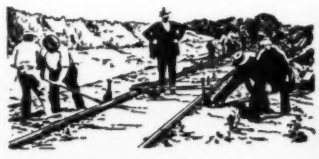
Colonel Oscar C. Maier has been appointed director of research for the **Pullman-Standard Car Manufacturing Company,** Chicago. Colonel Maier, who recently resigned from the engineering division of the United States Army Air Forces at Wright Field, Ohio, to accept his new position, is a graduate of the United States Military Academy at West Point, N.Y. He also holds master's degrees from Yale University and the California Institute of Technology. During World War II and the postwar years, he served in various capacities in the signal corps and in engineering capacities with the Army Air Forces.

Obituary

Edward J. Burnell, vice-president and general sales manager of the Link-Belt Company, Chicago, died at his home in Winnetka, Ill., on July 22.

William Hugh Coverdale, 78, one of the founders of the consulting engineering firm of Coverdale & Colpitts, died at St. Clare's Hospital, New York, on August 10.

(*Please turn to page* 904)



Trade Publications

(To obtain copies of any of the publications mentioned in this column, use postcards, page 835)

Anco Nuts—The Automatic Nut Company, Inc., has issued a folder describing Anco nuts, which incorporate a locking pin to maintain anchorage against vibration and shock.

Regulator Catalog—The Air Reduction Sales Company has published a 32-page catalog covering its complete line of pressure regulators, including units for welding, cutting, special flame processes, maintaining gaseous pressures in electrical equipment and other operations where controlled gas pressure is required. It illustrates 26 regulators and describes over 100. It also includes three pages devoted to flow and pressure gages.

Schramm Air Compressors—Schramm, Inc., has published six bulletins with descriptions, illustrations and specifications of the various models of Schramm air compressors. These are: Bulletin 4903 on the Model 60 engine-driven unit; Bulletin 4915 on the Model 105 engine-driven unit; Bulletin 4920 on the Models 210 and 315 gasoline-engine-driven units; Bulletin 4921 on the Models 105-210-315 I-H-C Diesel-engine-driven units; Bulletin 4930 on the Models 50, 105, and 210 power take-off compressors; and Bulletin FC-49 on the No. 50 self-propelled crawler air compressor.

Le Roi-Cleveland Paving Breaker—The Le Roi Company has issued a bulletin on its 52 A-J Air-Jack paving breaker, which tells how line air pressure is utilized to lift this 80-lb.-class machine and to free stuck steel. It also includes specifications of the breaker and pictures of the unit in action.

The Use of Power Track Wrenches vs. Hand Methods—The Railroad Accessories Corporation has issued a four-page report on a study comparing the use of Raco power track wrenches with hand methods in out-of-face bolt tightening, changing angle bars with a specialized gang, and removing and applying angle bars and tightening bolts with rail-laying gangs. The report lists the number of men required by the machine method and hand method in each type of work, the amount of work performed and the man-hours saved annually by the machine method.

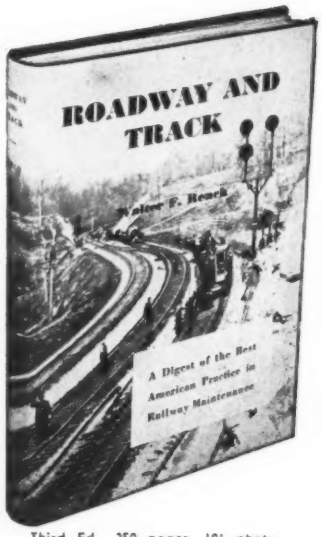
Track at Its Level Best—This is the title of a 24-page illustrated booklet, issued by the Power Ballaster Division, Pullman-Standard Car Manufacturing Company, on the use of three Pullman-Standard machines to save money in track maintenance operations. These machines are the Power Ballaster, the Power Track Cribber and the Ballast Cleaner. The bulletin describes each of these machines in detail, and gives case histories to show their economic advantages.

With Supplement Bringing Information Up to July, 1948

ROADWAY AND TRACK

By Walter F. Rench

Formerly Supervisor on the Pennsylvania Railroad;
Author of *Simplified Curve and Switch Work*



Third Ed., 350 pages, 101 photographs, 19 line drawings, 12 tables, index, 6 x 9, cloth, $5.00.

The third edition features the use of the latest mechanical equipment in connection with roadway and track maintenance. Older methods employed where full mechanical equipment is not available are also explained. While most of the methods described are those which are standard on the *Pennsylvania*, A.R.E.A. recommended practices and those in use on other well maintained roads have also been included.

Outstanding types of mechanical equipment used in track work are described and illustrated with action photographs. Engineering drawings show working details. The economies resulting from the adoption of modern methods are clearly outlined. Useful tables have been added to make the book suitable for reference use, as well as a practical handbook on modern methods.

For Track Supervisors

While written primarily to serve the needs of track supervisors and other maintenance officers, the new edition contains material of considerable interest to transportation and mechanical officers who require a working knowledge of the fundamentals of maintenance of way practice. Section and extra-gang foremen, who wish to acquire a broader knowledge of their work and of methods used elsewhere, will find the book helpful.

CONTENTS

Part I—ROADWAY: Essential Elements in Roadway Maintenance—The Right of Way—Drainage of Roadbed and Track—Vegetation for Banks—Economics of Roadway Machines—Labor Saving Methods and Devices in Roadway Work—Small Tools and Their Uses.

Part II—TRACK: Essential Elements in Maintenance of Track—Program for Maintenance of Way and Structures Work—The Track Obstruction—Power Machines and Equipment—Labor Saving Methods in Track Work—Track Materials and Their Uses—Practice in Rail Renewals—Practice in Rail Repair and Inspection—Maintenance of Main Tracks—Maintenance of Yards and Terminals.

Part III—SPECIAL PROBLEMS AND DUTIES: Maintenance Problems and Methods Used—Economics of Track Labor—Special Duties in the Maintenance of Way Department.

SUPPLEMENT: A 10-page Supplement describing new A.R.E.A. recommendations and changes up to July 1, 1948, can be cut for insertion in proper place.

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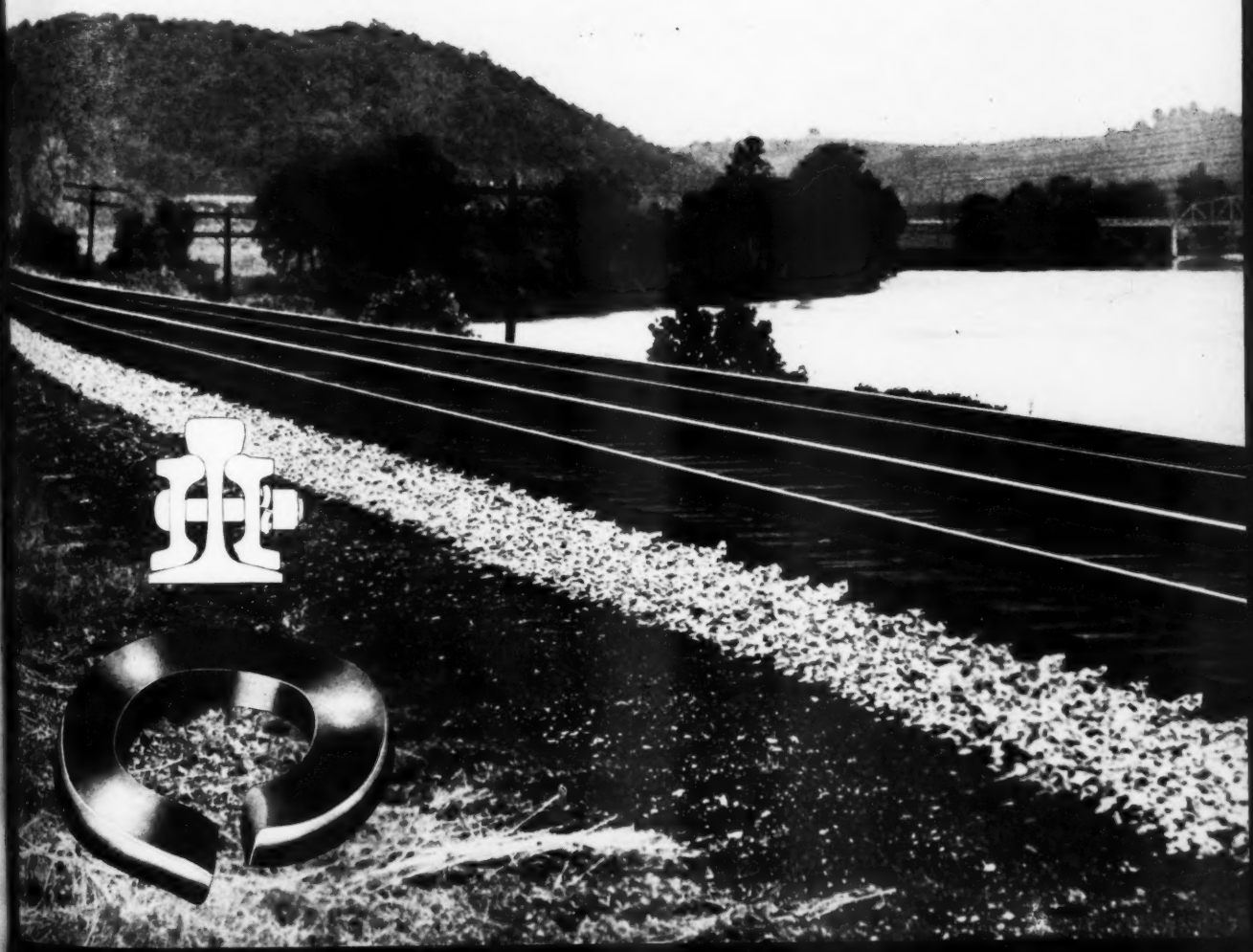

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